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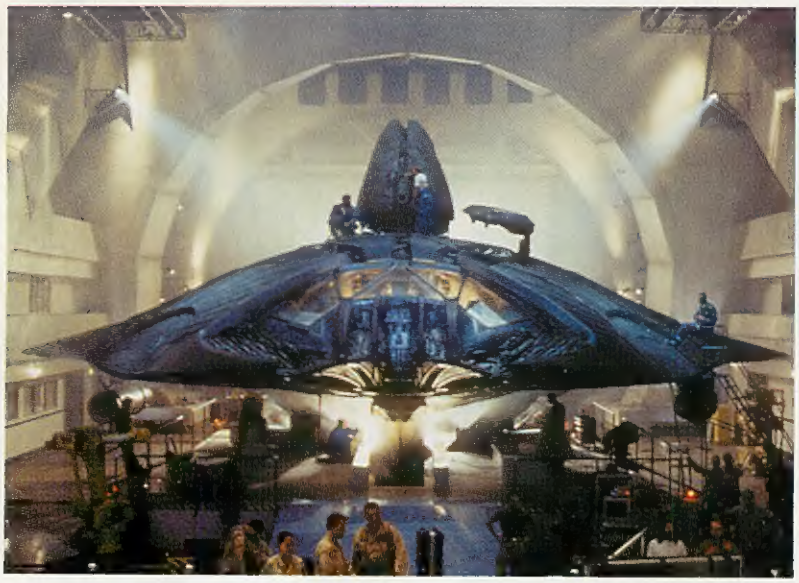

SCIENCE FICTION AGE

COVER: A new world may bring either new hope or new danger in John Berkey's Deadly Descent. *ABOVE: An alien attack fighter from this summer's sci-fi hit* Independence Day. *Read the movie column to prepare for the invasion.*

DEPARTMENTS

FICTION

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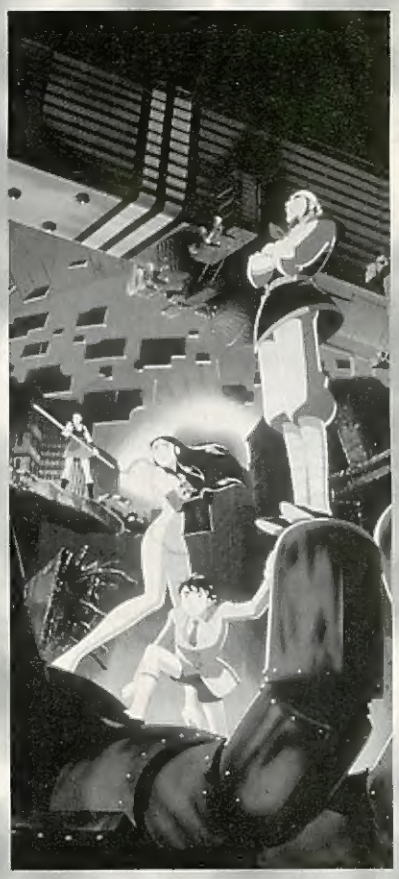

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I HAVE SEEN UNIVERSES OTHER THAN our own. I have walked on worlds distant and strange. So have you. That is one of the special joys of science fiction. But often, having created these new vistas, SF's finest writers just can't let go. They find that one story or novel is not enough alone to contain their new world, and so choose to visit them again and again, taking us along with them, hopefully using that chance of a fresh blank page to say something new about old friends and bring their fictional universes additional depth.

Over the decades, I have become lost in many an author's created locale, taking trips to them with the obsession that only a fan can know. Isaac Asimov took me to cool Trantor in his *Foundation* series. Marion Zimmer Bradley transported me to *Darkover*, a place that at a casual glance at first seemed to belong to fantasy, but which on closer examination was firmly rooted in SF at its heart. When I was a young teenager, E. E. "Doc" Smith's *Lensman* series (which had defined space opera in the 1930s) helped teach me what sense of wonder was all about. Ursula K. LeGuin's *Hainish* novels and short stories even today continue to dazzle as she adds to her tower of ideas. Bruce Sterling's *Shaper/Mechanist* cycle, Frank Herbert's *Dune*, Michael Moorcock's *Jerry Cornelius* ... the list goes on, and each of us has his or her own favorites. (As regular readers will note, Adam-Troy Castro's painfully hilarious Vossoff/Nimmitz disasters are on my list, and hopefully some of yours as well.)

In this issue, we are privileged to present a brand new universe from the pen of Stephen Baxter, whose short stories "Gossamer" and "Columbiad" you've read in these pages. His latest novel, the critically acclaimed *The Time Ships*, fits in perfectly with our theme, because it revisits the universe of one of the spiritual fathers of SF, H. G. Wells, by following up on the adventures of the Traveler from *The Time Machine*. (Arthur C. Clarke called *The Time Ships* "the most outstanding work of imaginative fiction since Stapledon's *Last and First Men*.")

Call them three short stories, call it a novella, call it whatever you wish, but Baxter's "The Saddle Point Sequence" marks what the author has called "the beginning of a new, open-ended future history," one that he will be exploring often in further short stories and novels as well. I have been thinking of this piece as a bonsai trilogy, for it has enough density of vision and Hard SF extrapolation to match many a novel. "In this future history I intend to couple a large-scale science fictional vision — of a human expansion into space, interstellar travel, and contact with extraterrestrials — with realistic science and nuts-and-bolts technology."

It is always an exciting thing to be present at the birth of a new universe, because the possibilities of things to come are endless. There is the sense that anything can still happen, and in capable hands, will. The reader knows that each new piece in the mosaic will broaden the range and help shed light on what has gone before. Baxter says that he will return to the universe of "The Saddle Point Sequence" often. "Further out," he writes, "I anticipate stories dealing with the originators of the teleportation network, a war with extraterrestrials over the Solar System's resources, stories of terraforming the outer planets, and even the sun ...."

It all begins here. Welcome.□

Scott Edelman

SCIENCE FICTION AGE

VOLUME 4 NUMBER 5

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Dear Mr. Edelman:

Just a note to tell you how much I enjoyed Geoffrey Landis's "Farthest Horizons." It was the most fun, most intriguing, most well-written story I have had the pleasure to read in a long time — sci-fi or no.

Landis gave us what every good storyteller should give — a compelling story with interesting, sympathetic characters. On top of that, he gave us — me, at any rate — a nice surprise. He began his story with a promise that he could not possibly fulfill, the old, trite, " ... only one came back. He was insane ... " ploy, but by the middle of the story I was completely drawn in, and by the end, that statement looked extremely credible.

And he gave us more. The character of David Tinkerman was exceptionally well-drawn. He was no "hero," in the ordinary sense, a dude who can handle every situation; whose perceptions form the basis of the story's point of view; someone who's always right, even when he's wrong. Rather, Tinkerman is a humble sort, a bit slow in seeing the big picture, but with great understanding. He is also a character of great depth — something rare in a short story.

And I can't say how delighted I was to be taken on a trip through quantum physics to land in cyberspace! Landis's idea that matter — structure — is information at the quantum level, was excellent. His elegant follow-through was the enigma — an upwelling of pure information. But since information without context is meaningless, the human psyche naturally provides that context. Herein lies the matrix for his narrative.

The beauty of the story provided a great deal of its strength. Descriptions of feathery crystalline structures; fractal surfaces; levels and depths; wrinkled reflection; echoes of ancient languages; masterpieces of abstract art .... Unlike so many stories that show the bleak, dark side of tomorrow, Landis's tale suggests the beauty and power that forms the complement of the cyberpunk future — if we will only look for it. It was a real inspiration to my imagination.

"Farthest Horizons" was a mature story from a fine writer, and I look forward to seeing more of Landis in your pages.

Ron Brown

Dear Editor:

I'm delighted with my first issue of *Science Fiction Age*, particularly with the fact that you've created another magazine for fantasy, thereby creating a division between what I feel should be separate genres. Those who purchase a science fiction magazine should get an entire magazine of what they paid for; the same for fantasy fans.

Right from the start, I was happy. I enjoyed Scott Edelman's editorial about Jack Williamson, especially since I've only recently read the *Legion of Space* stories. (I'm a baby boomer, and wasn't exposed to the space operas of the '30s — but I'm getting exposed in my middle age, that's for sure!)

Also, I was excited to learn that A. E. van Vogt is still alive. His stories, which I read twenty years late, as a teenager in the early '60s, had a tremendous impact on my reading and writing. I would love to write to him, if you folks know and could pass along his address. As Edelman pointed out, we should tell these writers what their work has meant to us before they pass away.

Thank you for a great magazine. Keep it up.

Sincerely,
Arthur E. Shaiken

Dear Sirs:

Regarding your May Science column ("Is the threat of global warming politics as usual or a true environmental menace?"), the climate has oscillated between glacial and tropical since the Pliocene. During most of this time hominid technology scarcely exceeded that of the chimps of Gombe.

Logically, warming must be due to some other cause. In fact, warming is a return to Earth's usual climate, so it is the *cold*, which cannot be blamed on technology either, that needs explaining.

Sincerely,
David C. Morrow

Dear *Science Fiction Age*:

A new and thus supportive subber, I characteristically prefer stories with a credible plot twist at the end, so I enjoyed Charles M. Saplak's "Brain Artist." Despite the negativity of the "downer" ending emerging, it packed a sizable double-wallop message of sorts against the so-called hassle-free illicit or experimental-type drug (mis)use, another plus. There's a nonevasive lesson there somewhere and it's doing this without being preachy or using demographics.

Regarding the carefully integrated illos, they deserve kudos for the most part, especially robot kinds of covers befittingly implementing stories and executed with expertise and finesse. A fan of the early Buck Rogers era — in respect not necessarily a regression — I have one request. We're not all cyber-engineers or (hand in hand) wallowing techno-nerds out here, so keep it comparatively simple and in-bound, please! Too many otherwise commendable SF sources in the biz don't anymore. (I have a problem with this among the myriad genre offerings today, is my point.)

But all in all, keep on like this and you'll always remain a strong contender to top my exclusive winners select list. The elementary proof is in the pudding.

Cordially,
Al Wiseman

Dear Mr. Edelman:

I'm really impressed by your new "Alternative Media" section of the magazine. It is really catchy with its mixture of different comics, games, models, and CDs. Just how do you find these products? Please make it easy for readers to order this stuff by including addresses and phone numbers.

Sincerely,
Marilyn Anderson

Dear *SFA*:

I really wish you would offer a free poster in your magazine every so often. What about making some of your past covers available or a picture from the gallery section? The 1996 calendar was great and I want more artwork to put in my room. I appreciate great art around me. How about Stephen Youll's robot or Vincent Di Fate's spaceship? Or more of John Berkey's spacescapes? I'd really like a poster of Michael Whelan's cover for the premiere issue.

Jon Gordon

Dear Readers:

Just as this issue was going to press, I was informed by the administrator of this year's Hugo Awards that your nominations have given me a place on the final Hugo ballot in the category of Best Editor. I'm proud that you who voted felt that the Sovereign Media crew and I have come so far in so short a time.

This year's ceremonies will take place at LA Con III, which will be held from August 29 through September 2 at the Anaheim Convention Center in Los Angeles, California. If you happen to be one of the 8-10,000 science fiction fans expected there, do say hello. I'll be the one with the biggest smile, because as the cliché goes, "It's an honor just to be nominated."

Thank you all.
Best,
Scott Edelman

Readers—please let us know how we're doing at: Letters to the Editor, Science Fiction Age, *P. O. Box 369, Damascus, MD 20872, or E-mail to S.Edelman1@Genie.Geis.Com. or use Compuserve address: 102746,2004*

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By Michael Bishop, Paul Di Filippo, and Richard Parks

Robinson's *Blue Mars* trilogy finale proves that no one does it better.

Kim Stanley Robinson has given science fiction its War and Peace. *Cover painting by Don Dixon.*

OVER THREE YEARS AGO, THE JANUARY 1993 issue of *Science Fiction Age* ran my laudatory notice of Kim Stanley Robinson's *Red Mars*, the first part of his proposed three-decker chronicle of the settlement, reconfiguring, and political liberation of Mars. The May 1994 issue of this magazine featured a column synopsizing my enthusiastic response to *Green Mars*, the bridge volume, a column in which I wrote that Robinson "has planted his colors on a world that most of us had long ago ceded to Ray Bradbury," thus making that "immemorial dreamscape" thoroughly and convincingly *his*.

Now, more than two years after the appearance of the second volume, comes *Blue Mars* (Bantam Books, 1996, 624 pp., $22.95), the highly anticipated finale, a work some 50,000 words longer than either of its admirable lead-ins. Indeed, Robinson has so conscientiously — not to say brutally — freighted this coda with information that it drags almost as often as it wags, sometimes assuming a character more encyclopedic than novelistic. In Robinson's struggle not only to do but to master his homework, *Blue Mars* exhausts by virtue of its exhaustiveness. I regard its seriousness as a virtue, however, and its meticulousness as a rebuke to the pseudoscience shakily undergirding much of what passes today as "science" fiction.

My nits do not constitute a dismissal. *Blue Mars* brings Robinson's ambitious interplanetary variant of the Victorian triple-decker novel to a decorous, even a noble, end. (I love its joyful final sentence.) The series itself will undoubtedly endure for years as the most realistic comprehensive treatment of the homesteading of an alien world in our literature. That this third installment lurches a bit, bulging with Falstaffian largess, primarily hints that Robinson declined to sell short either his material or his readers.

"A novel should be about *everything*," he told Charles N. Brown in a recent interview for *Locus*, "but how much can you include before it begins to sprawl? It has to have a [focal] point."

Blue Mars has as its focal point the working out of Ann Clayborne's opening declaration, "*Mars is free now*." The remainder of this volume — of the entire 1,600-page epic — focuses on the gathering and the institutionalization of that freedom, among the various settlements on Mars and among Mars' sister worlds in our solar system. Although Earth has succumbed to chaos (the result of population pressures and the melting of part of Antarctica), Mercury, Venus, and the moons of the outer gas giants have hosted some promising, if limited, exploration and immigration of their own.

Those characters outriding the long trek to Martian freedom include Ann Clayborne, Saxifrage Russell, Maya Toitovna, Michel Duval, and Nadia Cherneshevsky from the first two volumes, and Nirgal and Art Randolph from *Green Mars*. Anti-aging treatments enable the first group to persist into *Blue Mars*, while Nirgal and Randolph, who also use the treatments, represent younger holdovers who begin to experience mortality's bite as this last volume lumpily unfolds. The only important new character whom Robinson introduces, Zoya or Zo, daughter of Jackie Boone and an unnamed father, embodies a philosophy of hedonistic freedom and flight which, tellingly, fails to survive beyond the book's eleventh part — out of fourteen. This refusal to bring in new players permits Robinson to deepen our understanding of such vital old antagonists as Ann, the champion of Mars'

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primeval redness, and Sax, the terraformer and greatest scientist among the First Hundred, but it also piques our curiosity about the natives and the newcomers who will drive the planet when the First Hundred die; it guarantees narrative focus, but perhaps misses a dramatic bet.

In *Blue Mars*, suspense occurs in discrete units, from part to part. Only one unresolved, unresolvable question persists from early on to the end: the whereabouts of Hiroko Ai, leader of the rebel demimonde and proponent of the idea of *viriditas*: a mystic greening power that quickens not only the universe but well-attuned individuals like Nirgal. Sax experiences Hiroko's power when either she or a realistically hallucinated simulacrum rescues him from a snowstorm. Live or Memorex? Sax thinks the former, but Robinson kindles doubt; reports of Hiroko sightings rear up in later chapters like windmills on the Great Plains. In one overlong sequence, Nirgal, visiting Earth, journeys from the Alps to England to find not Hiroko but a bemused look-alike.

Other suspense generators include the likely consequences of removing Mars' solar mirrors; Ann's flight from a genetically engineered polar bear; the occurrence of memory loss and death among the First Hundred; and Sax's efforts to woo Ann Clayborne to embrace a humanly altered Mars.

More than either *Red Mars* or *Green Mars*, however, this last volume has the one-foot-

after-another feel of a grommet-factory tour. A mostly fascinating, commendably conducted tour (with dioramas devoted to the new Martian constitution; string theory in the 22nd century; soil manufacture; viruses, viroids, and virids; the distinctions among *deja vu*, *jamais vu*, and *presque vu*; putting names to colors; the biomechanics of forgetfulness and memory; etc.), but a tour nonetheless, an event requiring one to spectate more than to participate, to follow along more than to hike beside. I don't condemn Robinson for his tumbles into narrative sprawl and didacticism because I stand in awe of the cumulative power of this work. No one has written better about the topography and physical makeup of another world, and the people who come alive here — Sax, Ann, Nadia, Nirgal, Maya, and Michel, the homesick French psychologist — take vibrant fire in the imagination's eye.

I *wish* that I liked *Blue Mars* better. Robinson says many wise and beautiful things here, and his trilogy so far outruns in extrapolative merit Mary Shelley's far-future novel *The Last Man*, which gets a brief mention, that I wonder how Sax Russell could even glancingly approve an "SF" writer who surmised that soldiers of the 22nd century would go to war on horseback, and who anticipated neither airplanes nor computers. No one can foresee tomorrow, Robinson has noted, and toward the end of *Blue Mars* he has Sax confess, "Sometimes I get so *curious*. About the history we'll never know. The future after our death." Well, this trilogy, this remarkable labor of love, even if it falls a *mica lamina* shy of greatness, goes further toward scratching that profoundly human itch than any other novel I know. Its arguable defects notwithstanding, you should read it.

Next for Kim Stanley Robinson? A novel called *Antarctica*, where he spent five weeks as a guest of the National Science Foundation. Until he completes that book, we must all keep our curiosity — to echo the cadences

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3. Show you how to market your writing.

By the time you graduate, you will have written at least two manuscripts that are ready to submit to a publisher.

Of course, not everyone gets published; we simply promise you the best training available.

"I just can't say enough about the quality of instruction"

Students enrolled in *Breaking into Print* find that the program is truly a superior way to learn.

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"Over the years, I have taken writing classes at local colleges and they were very good," writes June Freitas, Salem, OR. "But my Long Ridge instructor was of more practical help and inspiration than all the [other] courses combined."

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There are two main roads to publication: fiction and nonfiction.

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When you return your test, our staff will evaluate it at no cost to you. If you qualify you'll be eligible to enroll. But that's entirely your decision.

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**The testimonials in this ad were provided voluntarily, without remuneration, by Long Ridge Writers Group students, from 1990 to 1996.*

of *Blue Mars'* final line — on ice, on ice, on ice, on ice, on ice.

Michael Bishop

***The Ringworld Throne**, by Larry Niven, DelRey, 430 pages, hardcover, $23.00.*

Is there any SF reader worthy of the name who has not yet visited the Ringworld, Larry Niven's ingenious slice of Dyson sphere? It seems hard to credit. And now, with the publication of a new *Ringworld* volume, unfamiliarity with this mind-boggling carousel of wonders is simply inexcusable.

Niven's seminal creation — a million-mile-wide habitable hula-hoop spinning around a tamed star, containing the surface area of three million Earths — marked the pinnacle of his own justly famous *Known Space* tales, and seemed naturally to lend itself to exploration across multiple novels. Yet so prolific of ideas is Niven that he debuted the Ringworld (in 1970 in a novel of the same name) in what was, by his own admission, fully intended to be a standalone story.

In that first book, a ship crewed by two humans (Louis Wu and Teela Brown) and two aliens (a puppeteer named Nessus and a kzin named Speaker) made the first outside contact with the Ringworld. The plot, while sustained by a number of political and character conflicts, was basically a tour of the Ringworld's marvels, culminating in a nerve-wracking hi-tech escape by the visitors. Although only a minute fraction of the Ringworld was visited and many mysteries remained, it seemed quite plausible that Niven would never return to this particular venue.

In fact, it was not until ten years in our mundane world had passed that Niven essayed another trip to the big wheel, in *The Ringworld Engineers*. Twenty years on in the *Known Space* chronology, a different puppeteer, the Hindmost, kidnaps an enervated, pleasure-addicted Wu and a graying Speaker (now christened with a new name, Chmee) for a return trip to the Ringworld. There they find that the unstable structure seems doomed to meet a fiery death by brushing against its star, and their own goals must become secondary to rescuing the world. Further races of the Ringworld are introduced, clues to its origin are elaborated (the construct was built and maintained by Protectors, the ultra-smart, fighting-machine ancestors of humanity), and its amazing geography is expanded. Successful in the end, the explorers are also marooned on the Ringworld. And unlike the opener, the second book clearly points toward a sequel — although few readers could have counted on having to wait sixteen years!

The Ringworld Throne is fully as complex and thrilling as its predecessors, although I found it to suffer from a bit of a split along a fault line inherent in the very *Ringworld* setting, yet one previously papered over. Before going on to tell you everything splendid about the new book, I might as well deal with this.

The Ringworld basically fascinates on two

levels: as a whole, and in its parts. Any structure boasting the landmass of three million planets is going to contain a myriad of exotic cultures. A lesser author could spend endless volumes just crafting repetitive adventures in such a setting. On the other hand, the infrastructure of Ringworld as artifact poses another whole set of enigmas and opportunities, more cosmic in nature. In the first two books, it seemed to me that Niven expertly integrated these two areas, with every tidbit of Ringworld culture contributing to the larger picture.

This time around, however, the first half of the new book is devoted almost exclusively to an adventure — admittedly with its share of thrills and new insights, yet ultimately somewhat peripheral — among a coalition of the natives, intent on eliminating a strictly local Ringworld menace. For the first two hundred pages, the Known Space visitors we have come to empathize with are almost entirely offstage (although we do learn that Wu has spent eleven years exploring, Chmee has gone native, disappearing from the plot, and the devious Hindmost has remained isolated underground in the Ringworld Repair Center). It is only midway through the book, when Wu, the Hindmost, and Chmee's eldest Ringworld-born son, Acolyte, reunite that the old flavor returns, as the alterations in Ringworld's big picture start to emerge, portending dire consequences for all.

Granted that some of the natives introduced in Part One play a small role in the latter half of the book, it still seems almost possible to have begun this sequel with the opening page of Part Two. Yet since Niven is never less than entertaining, and since Part Two alone is jampacked with enough action for any other single novel, it seems small-minded to carp overmuch.

In any case, the reader eventually discovers that although Teela Brown was revealed in *Engineers* as having been transformed into the planet's lone surviving Protector, such is not the actual case. A handful of other individuals have been warped by the potent tree-of-life root into competing guardians, each intent on gaining control of the Repair Center (the eponymous "throne"). Our familiar protagonists find themselves squarely in the middle of their deadly struggles, and it is only through a combination of luck and brains and courage that they manage to win through.

As always, Niven exhibits an admirable economy of prose. He crams a wealth of information into his limber descriptions and dialogues, so much so in fact that when the young kzin, Acolyte, confesses to being a trifle confused at times, the reader might well sympathize, for close attention must be paid when dealing with a plethora of Protectors. Niven continues to deepen the character of the centuries-old Louis Wu, presenting him at the end with perhaps the most drastic decision of his long life. That Wu puts off making his choice, plunging into an autodoc for a much-needed rejuvenation, clearly points us toward a sequel — one that I hope is not so far off we need to enter stasis to reach it!

Paul Di Filippo

None So Blind, *by Joe Haldeman. AvoNova, 304pp, hardcover, $22.00*

Joe Haldeman is primarily known as a novelist, yet his shorter works have been fairly consistent award contenders, and this collection is heavy with Hugo and Nebula winners. The variety of Haldeman's short fiction as shown here is impressive, from horror to alien-contact-multiuniverse-and-time-travel stories to short whimsies about the death of all the stars in the cosmos.

The lead story is called "Feedback" and is, according to the introduction, one of the author's favorites. In this story special artists called "facilitators" lease their skills to members of the general public or at least to those of the very rich general public. Special drugs and equipment make it possible to join two minds temporarily, allowing amateurs to paint with the skills of an accomplished artist, producing work that they could not have done on their own yet which is unmistakably theirs. The breakdown of barriers between two conscious minds proves to be as dangerous as it is liberating. This breakdown is not a surprise, though the ferocity with which it manifested frankly was.

In this story, as in some others, the reader is as much as told what is going to happen. Normally that sort of puncturing of dramatic tension would annoy me no end, but here it didn't seem to matter, and when the end came I was still not prepared. It's a disturbing piece.

"Passages" takes the old idea of a hunter guide — in this case Gregorio Fuentes, who specializes in leading rich clients on hunts of alien big game animals — and turns the premise into something else. Raj Benhaden III wants a special hunt and a special trophy: the skin of a *balaseli*, a particularly nasty creature found only on the quarantined world Obelobel. The balaseli is larger than a man, has no eyes, and hunts by sonar like a bat. It also has leathery wings like a bat's, covered with tiny hooked teeth with which it envelopes its prey and literally flays it alive. Obelobel itself is supposedly off-limits to any but the scientists studying the native humanoid race living there, but Raj Benhaden III has the money to remove that obstacle.

The Obelobelians have a rite of passage in which their young, one by one and only after the death of an adult, go into the caves where the balaseli live. If the children survive, they become adults and full members of the community. About half do. This apparently primitive initiation rite is not exactly what it seems, any more than is Raj Benhaden's quest for a trophy, but it's only as a rite of passage that Raj and Gregorio are allowed into the cave by the natives. Whatever the hunt had been originally for either man, a rite of passage is what it becomes.

"The Hemingway Hoax." What can anyone

Continued on page 96

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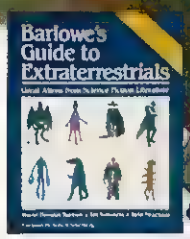

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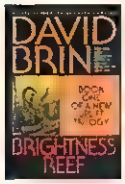

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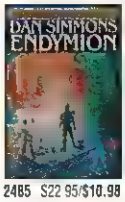

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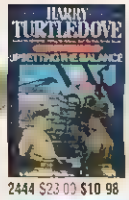

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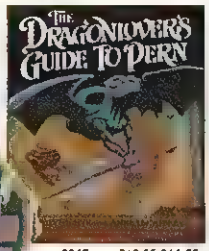

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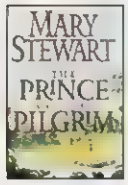

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ALTERNATIVE MEDIA

Beam Me Up, Barbie

Collectibles

IF YOU FEEL THAT YOU'VE GRADUATED BEYOND playing with dolls, then it's time to go where no Barbie has gone before. America's favorite doll couple has beamed up from Malibu, and they now stand ready to aid Captain Kirk on the Bridge. Thanks to Mattel's tribute to Gene Roddenberry's brainchild, the *Barbie and Ken 30th Anniversary Star Trek Gift Set* features the toothsome two-some authentically dressed as crew members of the Starship *Enterprise* from the original 1966-1969 television series. Barbie is dressed as an engineering officer, wearing a short red dress with gold trim, black tights, and black boots. Her accessories include a communicator and a tricorder. Ken is dressed as a commanding officer, wearing a gold jersey with gold trim, black pants, and black boots. He is armed with a phaser and communicator. Each doll stands 14 inches tall, apparently ready to embark upon a new five year mission. This year's cutest SF gift will be available this summer at finer toy stores near you.

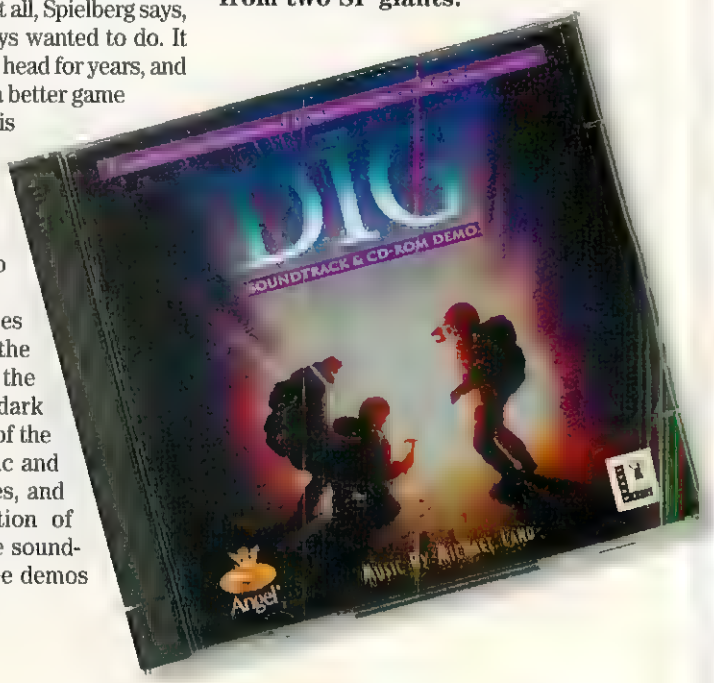
Digging Lucas and Spielberg

Music

THOSE OF US WHO CAN REMEMBER BACK TO the primordial days when the first video games were introduced will recall that the only sounds they produced were nothing more than headache-inducing beeps and boops. Times have changed. Instead of standing in video arcades shoving quarters into *Pong*, we're able to sit in the comfort of our homes in front of our own PCs, and instead of settling for electronic chatter, we're being gifted with complete orchestral scores. Further evidence that times have changed is that when Angel Records releases LucasArts CD-ROM adventure game *The Dig*, based on an idea of Steven Spielberg's, they will also release a soundtrack filled with composer Michael Land's Wagnerian score. Of the outer space story that inspired it all, Spielberg says, "It's something I've always wanted to do. It was a story I've had in my head for years, and I thought it would make a better game than a film." A game that is a cross between such classic films as *Forbidden Planet* and *The Treasure of Sierra Madre* deserves a classic score to match.

Says Land, "The themes reflect an interplay of the emotions of the game: the vastness of space, the dark and ominous landscape of the plant Cocytus, the magic and danger of higher realities, and ultimately the redemption of spiritual simplicity." The soundtrack also contains three demos from the game.

Another cosmic collaboration from two SF giants.



Cruising the Internet

It's time once against to cybersurf the World Wide Web, and pay a visit to these recommended home pages:

http://www.scifi.com

From the cool animation on the main screen to the beautiful layout on subsequent screens, the Sci-Fi Channel site is pure mind-candy. In-depth data on programming, an interactive chat section where webnauts are avidly shredding each other's fave authors, a choose-your-own-adventure *Beauty and the Beast* game, video clips, and audio chunks.

Web World

http://www.wizards.com

The zillion-dollar overnight sensations at Wizards of the Coast have produced a gamer's dream-site: tournament updates, high-stakes online contests, "secret" retailer previews, and list upon list of those precious, collectible cards.

http://www.strw.leidenuniv.nl/~vdmeulen/

More evidence that on the Web, science fiction and fact smear together. This project, inspired by Douglas Adams' classic *Hitchhiker's Guide to the Galaxy* series, is attempting to assemble a guide to the "known universe." Anyone can contribute, on any subject

www.tor.com

Patrick Nielsen Hayden and the good people at Tor Books have assembled the most net.savvy publisher's page online. Lots of free stuff — sample chapters, author photos, notes on the publishing industry — and *tons* of links to other SFnal resources online.

http://sunsite.unc.edu/lunar/ starship.html

Those nutty kids at the University of North Carolina have established the virtual Lunar Institute of Technology online. Your one-stop-shop for everything from sexy spaceship pictures to abstruse manifestoes on Relativity Paradoxes.

gopher://wiretap.spies.com:70/00/Library/Media/Sci-Fi/starwars.err

While you're waiting for Lucas to get around to releasing the new *Star Wars* movies, why not pop the original trilogy in the VCR and settle down with this guide to all that is Bad in the *Star Wars* universe — enough bloopers, mis-cuts, and errors to satisfy the most hyperfocused viewer.

http://www.ghostplanet.com

From the Cartoon Network comes this site dedicated to *Space Ghost*, the kitchy-retro SF cartoon show, a treat to the eyes and ears, laden with sound, pics and trivia, plus pricey consumer durables to buy.

Cory Doctorow

The Return of the Martians

IN 1962, AT THE HEIGHT OF THE COLD WAR, WHEN OUR PARENTS WERE more worried about a Cuban invasion than one from the Red Planet, the Topps Chewing Gum Company released a controversial set of trading cards that depicted a cartoony alien invasion delineated with graphic and bloody realism. The fifty-five cards of *Mars Attacks* depicted illustrations of the destruction of Washington, D. C., our soldiers charred by death rays, and even a Martian incinerating a little boy's pet dog. So violent was the national uproar against the cards that they were quickly suppressed. Over the years, the cards attained almost legendary cult status, finally spawning, in 1995, a re-release of the cards, which was quickly followed by comic books, novels, and a forthcoming major motion picture starring Jack Nicholson and Pierce Brosnan and to be directed by Tim Burton. Now, thanks to Screamin', Inc., the cards that our parents wouldn't let us keep have become model kits that will be collector's items. The vinyl kits include such figures as a big-brained Martian leader, dressed in his royal robes, clutching a tiny robe while stabbing at New York City with a dagger; and a 16-inch "real" Martian flying saucer, featuring a clear dome bubble top, a fully detailed cockpit, and a Martian pilot; a classic Martian warrior, garbed in a fully detailed space suit, backpack, helmet and ray gun, and many others. Each kit contains a unique collectible trading card and holder. The Martians may have lost out in the '60s, but they seem to be cleaning up in the '90s.

Collectibles

An SF Classic Reborn

Books

THANKS TO THE FAME OF HIS *MANGA* MEGA-epic *Akira*, the over-2,000-page comic book that was transformed into an animated film in 1988, Katshuhiro Otomo has become world renowned as one of the premier graphic creators of science fiction. But until now, his breakthrough work has never before been presented in English in its entirety. Now, thirteen years after it was first published in Japan in book form, *Demu: A Child's Dream* has been gathered as a trade paperback by Dark Horse Comics. When Otomo's vision of an urban physic war first appeared, it was an immediate sensation, selling more than 500,000 copies and becoming a particular favorite of high school and university students. The gripping story of a young girl's efforts to loosen a twisted old man's psychic sway over a claustrophobic apartment complex won Japan's Science Fiction Grand Prix Award, given annually by the Japanese Science Fiction Writers Association. It was the first and only time the award was given to a comic book. No surprise then that in Japan, *Demu* remains in print to this day. Otomo's classic dream has the density and vision of SF's finest offerings.

Four Color Science Fiction

Comics

SCIENCE FICTION HAS BEEN A PART OF COMIC books as long as there have *been* comic books. When *Famous Funnies*, the first published comic book appeared on the newsstand in 1934, it featured reprints of the *Buck Rogers* newspaper strips. *Planet Stories*, one of the Golden Age pulps, had a comic book incarnation titled *Planet Comics*. And the most famous superhero of them all, Superman, was the brainchild of two science fiction fans from Cleveland. So it's no surprise that the all-chromium collector card series *The Golden Age of Comics* (Comic Images) is filled with science fiction images from many of SF's own finest artists. This 90-card set features reproductions of classic comic book covers, with a history of comics on the reverse written by Ron Goulart. Goulart, known to SF fans for his dozens of novels and hundreds of short stories written over the past forty years, has also developed a career as a chronicler of the annals of comics with such books as *The Great Comic Book Artists*. Spaceships, death rays, dinosaurs, and giant green Nazi gorillas abound. Included among the featured artists are Frank Frazetta, Alex Schomberg, L. B. Cole, and many others. The series also includes randomly inserted autographed cards and a limited edition Medallion card.

The history of comic books is the history of SF.

AND ON THE 8TH DAY, HE SPLIT TO MAUI, AND LEFT YOU IN CHARGE.

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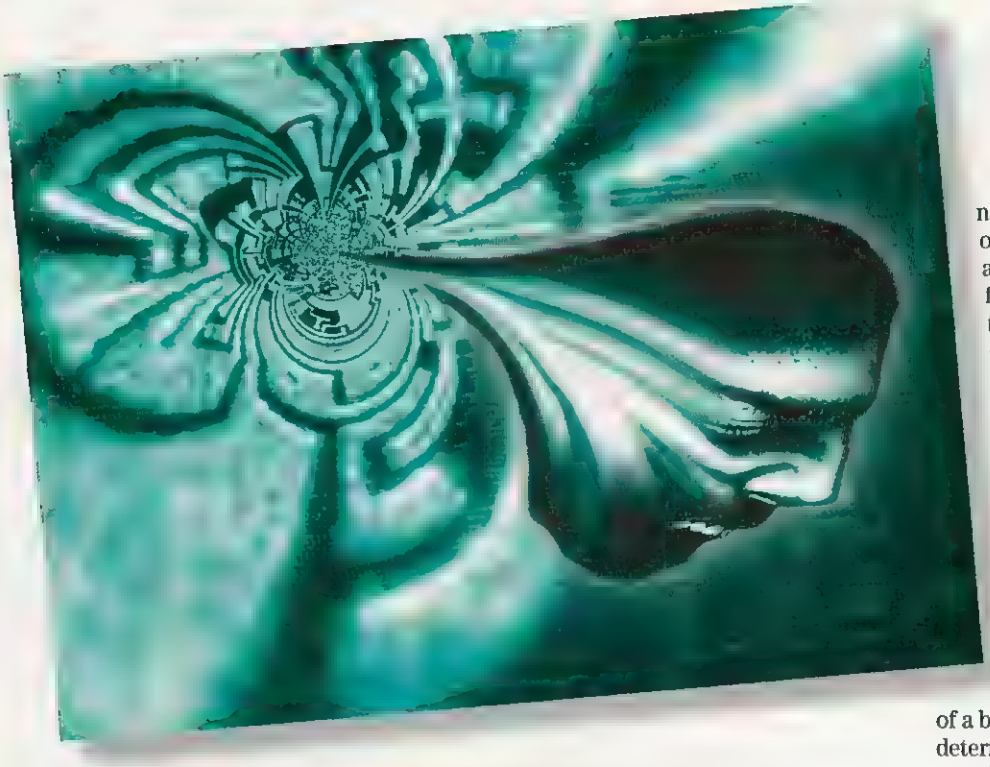

The Magic of Cyberpunk

Collectibles

MANY COLLECTIBLE CARD MANUFACTURERS are trying to create a science fiction game that will unseat *Magic: The Gathering* as the best-selling game of its type. It is perhaps only fitting that it is the visionaries at Wizards of the Coast themselves, the ones who first sparked the collectible card game craze, who have come up with the game that seems most likely to spark the imagination of SF gamers as their original offering (called *Magic: The Addiction* among its aficionados) has done for fantasy fans. Richard Garfield's latest two-player Deckmaster game, *Netrunner*, based on R. Talsorian's popular role-playing adventure game *Cyberpunk 2020*, is set in a neon-terrained tomorrow where free-spirited cyber-thieves and powerful corporations face off to decide who will ultimately control the data that runs the world. The starter pack includes two sixty-card decks, one that lets you play a street-smart Runner who is attempting to expose the hidden agendas of an immensely powerful megacorp, the other that places you in the role of a business-savvy corporate executive determined to push protected technology to radical new levels. *Netrunner* sets you down in a gritty cyberpunk future where information is power, and whoever can control that information and complete his agenda wins. There are currently more than 350 different cards that detail this high-tech, futuristic world, available both in the starter packs described above and 15-card booster packs. For further information, visit Wizards of the Coast's Web site at http://www.wizards.com.

NEW ON VIDEO

***Out There*:** Bill (*The Rocketeer*) Campbell stars as a photographer who discovers a 25-year-old roll of undeveloped film of a purported UFO encounter. As he investigates to determine the truth, he crosses paths with Bobcat Goldthwait, Rod Steiger, and Julie Brown.

***Mystery Science Theatre 3000*:** While you wait for the big-screen version of the classic cult series to appear later this year, amuse yourselves with their skewerings of three good bad movies, "The Amazing Colossal Man," "Mitchell," and "The Cave Dwellers."

***Species*:** This tense thriller of alien sexual encounters starring Ben Kingsley, Forrest Whitaker, and Natasha Henstridge is being re-released in a Special Collectors Edition containing a behind-the-scenes, making-of-the-movie short. Directed by Roger Donaldson.

***Alphaville*:** This classic 1965 surrealistic film by Jean-Luc Godard was an inspiration for Martin Scorcese and Quentin Tarantino. Into a post-apocalyptic city comes space spy Lemmy Caution on a mission to destroy the supercomputer Alpha 60.

***Zarkorr the Invader!*:** Watch out, Godzilla! Move over, Mothra! Coming from Monster Island Entertainment is the first United States-made, city-crushing, giant monster movie in decades. Plus a bonus featurette on the creation of the monster.

***Battlestar Galactica*:** Twelve episodes are being released of this late '70s SF series that was TV's first response to the success of *Star Wars*. Join Lorne Greene, Dirk Benedict, and Richard Hatch as they battle Cylons and search for the mythic lost human colony of Earth.

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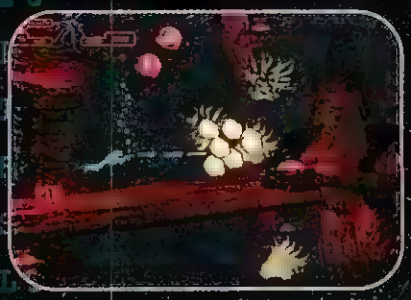
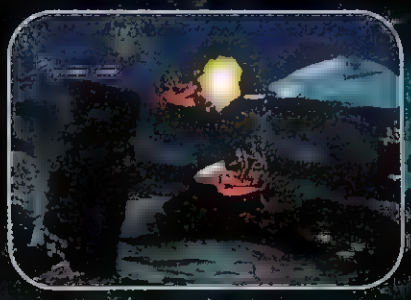
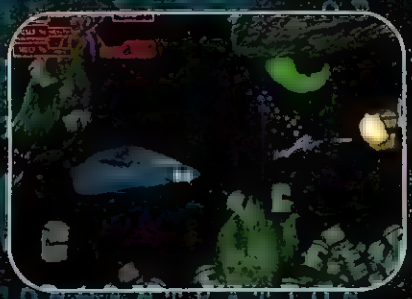

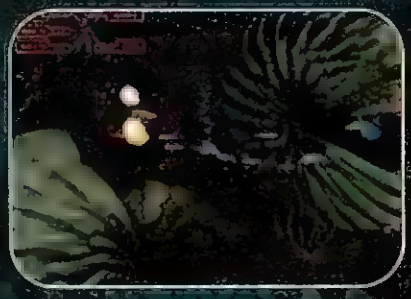

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By Dan Perez

Alien invaders bring global disaster on *Independence Day.*

In Independence Day, *the craft uncovered during the now famous Roswell, NM incident (above) proves to be an alien attack fighter. Scientists, including* ST:TNG's *Brent Spiner as wacky Dr. Okun (right), search the craft for clues to thwart the invaders. During the invasion, the aliens' powerful weapons turn a variety of urban landmarks into rubble (below).*

IN 1972'S *THE POSEIDON ADVENTURE*, GENE Hackman and Shelley Winters had to escape from a capsized ocean liner, and in 1974's *The Towering Inferno*, Paul Newman and Steve McQueen found themselves trapped in a burning skyscraper. What do these Irwin Allen disaster movies have in common with the alien invasion movie *Independence Day*? More than you might think.

Independence Day is the newest film from the team of Roland Emmerich and Dean Devlin, whose last collaboration was 1994's *StarGate*. For *Independence Day*, the pair co-wrote the script, with Devlin producing and Emmerich directing.

"I used to be an actor," says Devlin, relating how he and Emmerich first met, "I was an actor for twelve years. I was cast to be in a movie that was shooting in Germany, and Roland was the director, co-writer, and producer of that film. And when I was out there, I found the most beautiful sets I'd ever seen, some of the best camera work I'd ever seen, and it was the first time I'd ever worked with a director who really knew how to talk to actors.

"And while we were working on it, I asked him if it was OK if I were to rewrite some of my own dialogue in the film. He said, 'Sure, go right ahead,' and he seemed to like what I did with the dialogue. So when the film was finished, he went to do some rewrites on the film, and he asked me if I'd work on it with him, and I did. We had such a good time working together. We realized that we both saw movies basically the same way. So when he was brought out to Los Angeles to direct his first film, he asked me if I'd write the script for him. And I did, and that's how our partnership began. At the end of that experience, he said 'Listen, I think you should be a partner here at Centropolis (Emmerich's production company). I joined a company that he and his sister Ute had formed nearly ten years earlier, and became a partner, and we've been making films ever since."

Independence Day is the story of a devastating alien attack on the Earth, and it starts with a bang as major cities around the globe are obliterated by 15-mile-wide firestorms generated by the invaders' ships. In short, it's the ultimate disaster film, and Devlin admits that he and Emmerich were influenced by Irwin Allen's hugely successful disaster epics. "Structurally," he says, "the film is *totally* based on the disaster film structure of the Irwin Allen films of the '70s; I would say particularly, *The Towering Inferno* and *The Poseidon Adventure*. They were great films — those films were way ahead of their time. They really invented the *event* modern epic. Before then, an epic had to be a period film, and [disaster] films kind of redefined an event picture. But they also did something else that was really poignant to today. In the '80s the way we started making event movies was we made cartoon heroes the star of the movie. We turned our actors from characters into superheroes. Now, there's a problem with that. The problem is: You

Will Smith and Harry Connick, Jr. (above) play Marine fighter pilots who take on the aliens in the air. Will Smith and Jeff Goldblum, as computer whiz David Levinson (below right), devise a plan to use the captured alien fighter against the attackers. Though Twentieth Century Fox has kept photos of the 8-foot-tall aliens tightly wrapped, Trendmasters, the multimedia toy company making the toy action figures has posted this photo (below left) on the Internet.

know that if this one superhero is starring in your movie, then you know the ending of the movie.

"I think when we first did this, it was fun, because it was the first time guys who actually looked like cartoon characters were seen in the flesh. I think there was a real kick to that. But the downside is that after a while, you know he's going to survive, you know the bad guys are going to lose, and you're just waiting for the movie to finish.

"The disaster film, however, had a different structure. Anyone could go at any moment because it was a large cast. And you could somehow still have a fulfilling ending without having to do the happy ending. In the last scene of *The Poseidon Adventure*, Gene Hackman *dies*. And in *The Towering Inferno*, even though some of them survive, at the last moment you have McQueen and Newman turning to each other and saying, 'How many more buildings have to burn down?' They didn't feel this need in those films to make everything so pat. And so we thought, what if we had a movie that had twelve characters from disparate backgrounds and put them together. You don't know who's going to walk out or not at the end of the movie. We all know that movies have to be fulfilling; you have to feel like it was worth your two hours and $7.50 to sit through — that's all well and good. But how do we make one so it's not predictable? The disaster film is the perfect structure for doing that in a modern adventure movie."

Independence Day's eclectic cast includes Will Smith (as an American fighter pilot learning to fly a captured alien ship), Bill Pullman (as the president), Mary McDonnell, Judd Hirsch, Margaret Colin, Robert Loggia, Harvey Fierstein, Brent Spiner, and Vivica Fox. The film also features a large supporting cast (140 speaking roles) and some incendiary effects sequences, including the much-publicized destruction of the White House, and all of it was done for roughly the same budget as the more modest *StarGate*: approximately $60 million. "When we were shopping *StarGate*," Devlin recalls, "a lot of places were interested, but nobody believed we could make it for the budget. Everyone kept saying 'It's a $100 million movie, it's a $100 million movie.' We said 'No, we think we can do it for under $60 million.' And we did: That film came in on time and on budget.

Then when we put this script out, which is probably ten times bigger than *StarGate*, and we said we could do it for roughly the same budget, we were expecting everyone to look at us and think we were nuts. But I think because they saw *StarGate*, they were willing to give us the benefit of the doubt. We came in right on time and on budget. We shot this film in 72 days, which is 14 days shorter than we shot *StarGate* and 10 days shorter than we shot *Universal Soldier*, so we're very proud of how we ran the production on this movie."

How did the director/producer team keep such a daunting production organized? "We call it organized chaos," Devlin quips, laughing. "And with the organized part loosely defined. We've been very fortunate in that we've always worked with really talented people. When we took this on, we turned to all of our staff and said, 'Look: We're going to ask you to do the impossible here. We're going to ask you to do a movie that's much bigger than what we have the money for. Now

Continued on page 93

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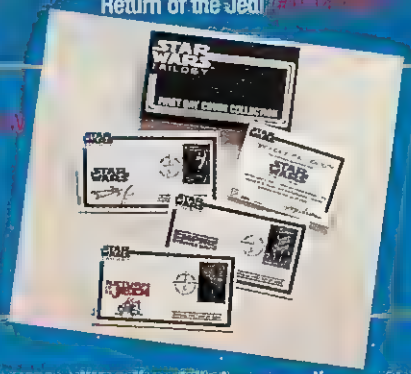

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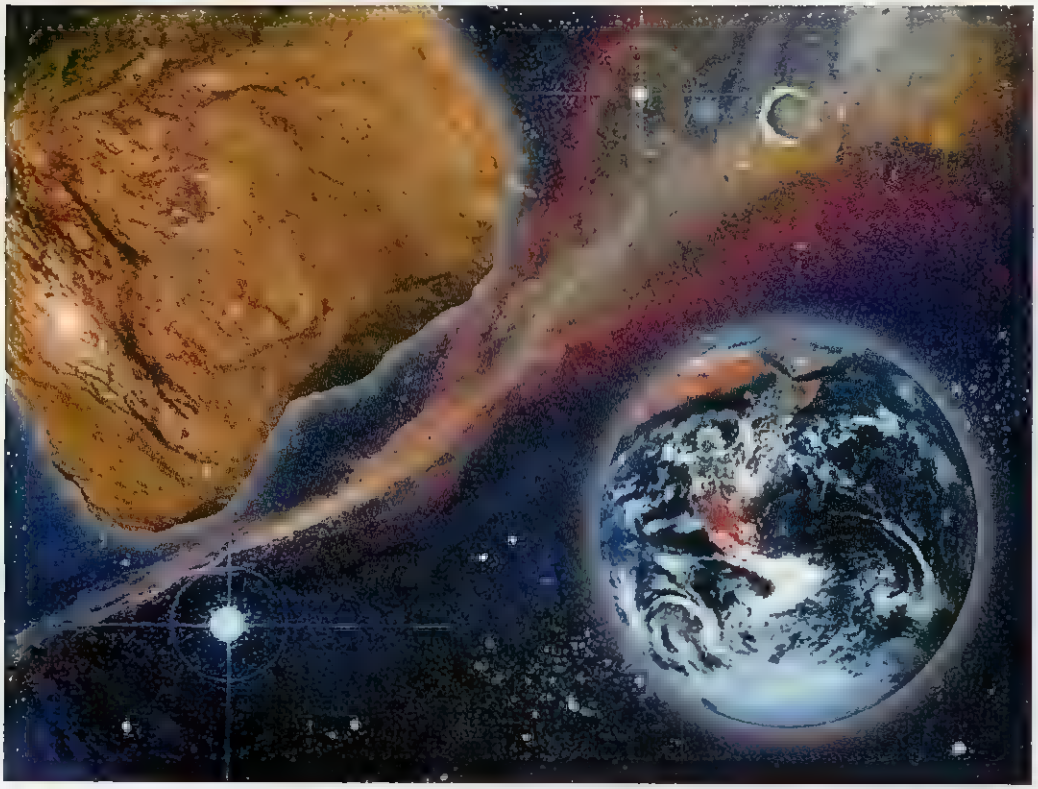
By Doug Beason and Geoffrey A. Landis, Jr.

If you look up in the sky, you might see the end of the world.



Every 25 years we can expect to get hit by a 200 KT (or 0.2 Megaton, MT) rock. We can expect a 10-kilometer dinosaur-killer asteroid roughly once every 100 million years. Planet Killer *by Oscar Peterson.*

A FEW MONTHS AGO, YOU MAY HAVE BEEN ONE of the many who sought out the darkest nighttime spot possible to view Comet Hayutake, one of the most amazing astronomical spectacles in decades. But as the dinosaurs well know, not all cosmic travelers are as benign. To discuss the possibility of a space fragment going astray and doing damage to planet Earth, *Science Fiction Age* met with Doug Beason and Geoffrey A. Landis.

Doug Beason worked for the president's science adviser on the White House staff under both Bush and Clinton. He has worked on space issues for many years, including astronaut Tom Stafford's presidential commission to create plans to go to Mars. He is a Nebula-nominated author, and his latest of nine novels, *Ignition* (co-written with Kevin J. Anderson), will soon be released as a major motion picture. Geoffrey A. Landis works for the Ohio Aerospace Institute at the NASA Lewis Research Center. Landis has won a Hugo Award for "A Walk in the Sun," and a Nebula Award for "Ripples in the Dirac Sea." Landis' most recent short story to appear in these pages, "The Kingdom of Cats and Birds," was reprinted in *Year's Best Fantasy and Horror* and is on the current final Nebula Awards ballot for Best Short Story.

SF AGE: Some say that it was an asteroid impact that caused the death of the dinosaurs. Some say that a meteor strike in our own future could do the same to us. What is the frequency of this sort of thing? Is it enough that we should we care?

BEASON: As a background for people, the asteroid belt is a toroid half-way between Mars and Jupiter with gaps due to perturbations and chaotic zones. The asteroids have a total mass of a few percent of that of the Moon — with the largest being Ceres, weighing as much as one-third of the total asteroids. But we don't have to worry about those asteroids — what we have to worry about are the so-called "near-Earth asteroids" (NEAs).

LANDIS: Tom Gehrels, one of the most active asteroid researchers working today, says that we can expect roughly one impact by a kilometer or larger asteroid every 300,000 years. That would release an amount of energy equivalent to something like several billion tons of TNT. Bigger asteroids collide with the Earth less frequently. We can expect a ten-kilometer dinosaur-killer asteroid roughly once every 100 million years ... but when it hits, it kills *everybody*.

SF AGE: As you look at the surface of the Earth, what are the major signs of this in the past, such as major landmarks and geological formations?

LANDIS: Some 150 asteroid-impact craters have been identified on the surface of the Earth so far. And, of course, there are likely to be many more that we haven't noticed yet, eroded to almost nothing by water and weather. Like the 180-kilometer diameter Chicxulub crater that was eroded away to near invisibility.

BEASON: I've got some statistics I'll share about getting hit by these near-Earth asteroids. The Earth gets hit every year by about 20 kilotons (yes, 20 thousand tons) of debris, including near-Earth asteroids. Most of that debris is dust and pebbles, but occasionally we get walloped by bigger stuff. In fact a "one-year event" — the biggest NEA we expect to be hit with out of that 20 KT — is a 6 KT rock.

LANDIS: Fortunately those yearly impacts dissipate their energy in the upper atmosphere!

BEASON: Every 25 years we can expect to get hit by a 200 KT (or 0.2 Megaton, MT) rock; that's called a twenty-five-year event. Every 100 years there's a high probability of getting smashed by a 1 to 3 MT chunk — kind of like the probability of having a "100-year flood" — you may get two in a century, but then you won't expect one for a

while. The thousand-year events, or 10 to 50 MT chunks, happen every thousand years — or at least there's a chance of them hitting.

LANDIS: Fortunately, most of the area of the Earth is water. Most of the rest of the area of the Earth is sparsely populated. But if one *did* hit a populated area, we could be in trouble!

BEASON: The Tunguska event that hit in Russia in 1908 was 12 MT, or a 1,000-year event.

LANDIS: It's not clear that Tunguska-class events are so rare, Doug. There is some evidence that there was a Tunguska-class impact in Brazil in 1930. (Tunguska is believed to have been a stony meteoroid with a diameter of about 50 meters; it hit Siberia in 1908.)

BEASON: Asteroid impacts can affect a large number of people. The probability of death is actually quite high. It's all nested in the probabilities because of the huge number of people a big one can affect. I'm getting my data from Dr. Clark Chapman from the Planetary Science Institute in Arizona; he attended a workshop on Impact Hazards from NEAs in Snow-Mass a few years back and it's become the standard for the field. For example, here are some relative statistics: Risk of death from botulism: 1 in 2,000,000. Risk of death from fireworks: 1 in 1,000,000. Risk of death from tornados: 1 in 50,000; an airplane crash: 1 in 20,000; from an NEA: 1 in 6,000; from an automobile accident: 1 in 100. So you can see, relatively speaking it's a high risk.

This photo taken by the Galileo spacecraft shows asteroid 243 and its moon. The asteroid, located in the main asteroid belt between Mars and Jupiter, is about 56 kilometers (35 miles) long. The asteroid's moon is estimated to be about a mile across in this view.

SF AGE: Doug, that's based on one NEA every how many years causing how many deaths each time?

BEASON: It's the risk of death one person has due to an NEA. Auto accidents, murder, tornados, and the like only affect a *few* people; NEAs have the chance to affect a lot.

LANDIS: The actual fact is, nobody knows for sure what the actual impact chances are; nobody's ever done a complete survey of the population of Earth-crossing asteroids.

BEASON: You're right, no one has yet mapped *all* of the NEAs, but all those above 15 KM in diameter have been mapped. Only 10 percent of those bigger than 1 KM in diameter have been mapped.

LANDIS: Since there are only about 10 Earth-crossing asteroids 15 kilometers in diameter, those aren't the ones we worry about. It's the 1 to 10 kilometer-diameter

ones, like the one that killed the dinosaurs, that are the deadly ones.

BEASON: You're right. But it's not the 15 KM ones we have to worry about. It's the smaller ones ... anything above 15 KM and we're goners. Unless we can send out a missile and nudge the NEA away with an explosive (it will give our friends in DOE an opportunity to use all those nukes they've developed). But we have to be careful — because if we hit the asteroid too hard, we could shatter it and it would rain rocks on us, maybe even hurting us more with a shotgun like affect!

LANDIS: You very well might not want to shatter the one coming toward you! A shotgun blast can be as deadly as a rifle bullet. You want to push it out of the way.

BEASON: That was exactly my point! There's a fine line between being able to push it away (I prefer nudge) and shatter — don't shatter it! But you need enough energy to nudge it.

LANDIS: Right. How you do it may very well depend on how much warning you get. If you have a lot of warning, a very gentle nudge will do it.

BEASON: There are three major group types of NEA: the low albedo (C-P-D), S, and M (or metal). S-types (they think) are stony-iron, probably ordinary chondrites, or both. P-D types are not well-characterized, and are probably carbonaceous (C). Also, there are problems in trying to detect the asteroids. One, they're very faint (less than 10th magnitude). If you can see them in a "streak" camera image, then they're moving across the sky and aren't a threat.

LANDIS: Not a threat *this* orbit, that is!

BEASON: But if they're NOT moving in your camera, the only way you can spot them is if they grow larger in magnitude — a much bigger problem. But that's also bad news, because it means it's coming for you! Geoff — do you know how long we have for detection? A few days?

LANDIS: Not even that long, sometimes — quite a few of the near-miss asteroids that have been detected were first seen when they were moving *away* from the Earth.

BEASON: In 1968 Icarus came within 4 million miles of Earth. NEA 1989 FC came by in 1989. In 1989 FC was between 200 and 500 meters in diameter. It came by March 23, 1989, the closest any asteroid had been observed, but *after* it passed! It was observed several days later at Mount Palomar — it passed less than twice the distance to the Moon.

SF AGE: Do we have reason for concern? Should we be taking action for a defense against these things? Is this potential threat being taken seriously by scientists and government? What exactly are we doing in terms of research and development to find a way to protect Earth from that potential killer?

LANDIS: Right now, all we are doing is looking; watching the skies and counting asteroids. Even that, the project to find near-Earth asteroids, is a very small project.

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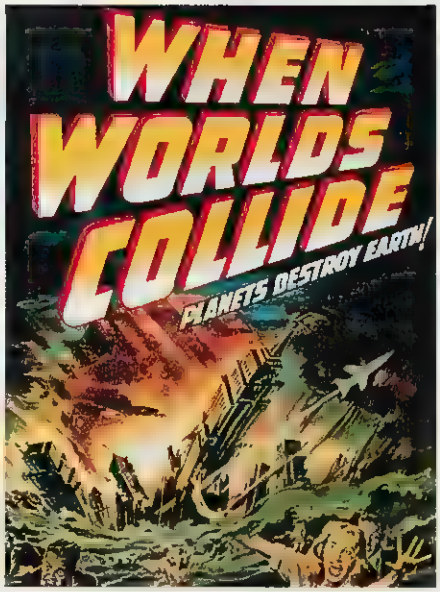

In the '50s SF classic When Worlds Collide, *a space "ark" escapes with the only humans destined to survive when a rogue planet and its moon destroy Earth.*

SF AGE: Well then Geoff, what are we *considering* doing?

BEASON: Right now we're just observing. However, the U.S. Air Force just completed a study called Air Force 2015. They list one of the biggest national security concerns for the U.S. Air Force in the 21st century as "planetary defense" — not against alien invaders, but against NEAs. This would involve setting up observation sites like Geoff said, but also investing in some anti-NEA technology to "nudge" the NEAs.

LANDIS: Only about 10 percent of the estimated population of 2,000 kilometer and larger diameter near-Earth asteroids have been detected so far. So there's a lot of looking left to do!

BEASON: The reason why they think it's a concern is that it's been several years since we've been smacked hard, and the statistics are working against us. Also, many more people are around now than in the past. But it's not like the U.S. Air Force is going to drop everything and start building asteroid smashers — rather, it's just an awareness program now. I seriously doubt they will do much more than upgrade some telescopes and set up a monitoring system.

LANDIS: It may not even be necessary to use nuclear warheads to deflect an asteroid. It turns out that many of the near-Earth "asteroids" are actually the remnants of burned-out comets. One proposal is to set up huge sheets of metal-coated plastic foil, to focus light onto one side of one of the asteroids. The light vaporizes the cometary volatiles, and the reaction force moves the asteroid in the opposite direction, slowly but surely. Another thing I think is worth emphasizing is that these Earth-crossing asteroids are not merely a threat; they also represent an opportunity. From Earth, the Earth-crossing asteroids are the easiest objects to reach in the solar system. This means that they could be perfect targets for missions to explore the solar system. The probe that NASA launched last month, NEAR — that stands for "Near Earth Asteroid Rendezvous" — will go to the asteroid Eros; it will be the first mission to orbit an asteroid. As a science fiction writer, I'm excited by the potential uses of asteroids: As sources for steel for space construction; as sources of hydrogen and oxygen for rocket fuel; and for their content of precious metals such as platinum and iridium, just for pure profit.

BEASON: Geoff — did you hear of that NEA defense meeting that SDI had a few years back in Italy? Someone told me the Pope even showed up for a speech — and he was impressed the United States and U.S.S.R. were going in on something together.

SF AGE: Tell me a little more about the NEA Defense meeting. How often have they been held? How long? Under whose auspices?

BEASON: SDI sponsored one in Italy in 1993. I know some of the national labs attended. There may be some more meetings now, through the AIAA (American Institute of Aeronautics and Astronautics), which sponsored a meeting on 1995.

SF AGE: Have they issued any call to action or recommendation as the result of these meetings?

BEASON: Yes.

SF AGE: And these were?

BEASON: The AIAA has come out with a "position paper" on NEAs and the threat. They recommend what I've been saying: We need more stringent mapping. We can do this with relatively small telescopes — on the order of 24 inches. What's important is getting CCDs set up and networked so a database can be built.

LANDIS: The "Spacewatch" telescope on Kitt Peak is about 24 inches. This is the prototype of the CCD-based asteroid search telescope, run by the Spacewatch project, under Tom Gehrels. I saw it when I was out at Kitt Peak in 1992— very impressive! They run a sweep across a patch of sky in half an hour, then repeat it twice. They compare the CCD pictured. If anything moved in the patch of sky, their computer catches it, and they've found an asteroid.

BEASON: But as far as actually building a defense ... look, Scott, defending against the old U.S.S.R. was expensive enough, and everybody could see what they were doing. Congress just won't pay to build something based on statistics. Especially not a defense system! They say our nation has bigger problems than NEAs.

SF AGE: So it will just be the SF writers and scientists talking about it until one day we get to say "I told you so"?

BEASON: You're right, Scott. So I really think SkyWatch, or some variant of it will go. And unless something *huge* hits the Moon to give us a demo, like comet Shoemaker Levy 9 hit Jupiter, then we won't ever build anything. □

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The Doenr had found a way to remove a person's soul.
But what would take its place?

FROM THE BLUEJOINT PRAIRIE ON WHICH THE spaceport lay, the city of Ganhk resembles so much glassware on climbing red-slate shelves. I stumbled out of the iduumship *Desideratum* with my fellow steerage passengers, many of us Corderists, and saw Doen's most famous city glittering across the plain like an exotic bottle collection. (Locals call the planet Doen; nearly everyone else uses the name of its Ommundi discoverer, Sagence.) I shielded my eyes, steadied myself on the tarmac, and ogled Ganhk's huge pastel replicas of test tubes, retorts, beakers, thermoses. A magnetrain would take us to this city, where, in a chapterhouse of the Galenic League, a surgeon would destroy the tumorlike growth that made and sustained me Corderist. A female voice said, "What do you think, Drei?"

The strangeness of this new place — its gravity, its light, its smell — had unsettled me, but how could I fail to admire its artfulness, the sanity of its order?

"Lovely," I said. "Nothing lovelier under heaven."

"Yes," said my friend. "A lovely place to have one's hope of heaven cut away."

I said, "If that can really occur, maybe we'll find heaven here on Doen itself."

The smile on Zarafise Koh's face hinted that our long glide through the iduum had multiplied, not allayed, her misgivings.

"Pray," I advised her.

"Why? Haven't the lucidists shown that prayer doesn't work, except maybe as an anxiety inhibitor?"

"Then use it in that way," I said.

"I've never found it more than fitfully helpful," Zarafise said. "Besides, nothing so irrational could ever work here on Sagence."

She had a right to her bitterness. On the other hand, no one had forced her to come. The majority lucidists — whether of Doen, Trope, Tezcatl, or any of the other Ommundi worlds — would never perform the procedure on an unwilling patient. The idea of a coerced surgery appalled them. However, any sufferer of a cultural or a maverick superstition who *wanted* the procedure could have it, free of charge. Ommundi footed the entire bill, offering iduum transport to Doen (in steerage), preliminary psychotherapy, and the procedure

THE PROCEDURE

BY MICHAEL BISHOP

Illustrated by Bill Stoneham

"Of course you grieve. You view the procedure less as a cure than as an assisted suicide."

itself. Physicians on Doen had pioneered this technique and then restricted it to medical facilities in Ganhk, as a spur to the planetary economy and a boost to their prestige throughout the Commonweal. Lucidists who chastised their fellows for placing artificial restrictions on a procedure designed to eradicate superstition — to let in the light of reason — earned patronizing pats on the head, if not the monolithic cold shoulder of the planet's most powerful national state.

In any event, Zarafise Koh had come voluntarily to Doen, which she called Sagence, with hundreds of other religionists, including a large contingent of Corderists (me among them) and smaller groups of animanists, witnessers, eldeists, nirvanim, mahdiacs, and so on. Like me and the others, she had chosen this way to assimilate fully to the benign, but dynamic lucidism of the Ommundi Commonweal. Like me, she had her doubts that Ganhk's surgeons would truly rescue us from our faiths or our marginalization.

Children popped up on the tarmac, almost as if they had ridden invisible elevators to its surface. They wore scarves of peacock blue, bottle green, sulfur yellow, hematite red. They tripped about us, barefoot or slippered, smiling — so that Zarafise Koh and almost everyone else from iduumship steerage were charmed. The children had come as escorts. They took our hands to the amplified strains of *Wind is to Sky as Voice is to Mind,* then skipped us across the tarmac toward the squat white plyons of the magnetrain cradle.

"Beautiful," said Zarafise as the urchins tugged us along. "Such spry, loving children."

"They don't appear brainwashed." I smiled as I said this.

Zarafise grimaced — then grinned in acquiescence as the kids danced us up into the magnetrain's trembling capsules.

DON'T ASK ME EITHER WHERE our escorts vanished once we had boarded that ivory train, or how the city of Ganhk absorbed such a flood of believers once we'd poured onto the tiled reception platform among those daunting bottle towers. You would think that the efficient processing of so many patients would require long lines, reception gates, a storm of broadcast directions and announcements, but none of these methods prevailed.

There on the platform, a petite girl separated me from Zarafise Koh and the others and led me into a tunnel through which citizens strolled like people on holiday. In every tributary, the tunnel had a beveled skylight and well-spaced festoonings of plants and banners. At length, it funneled us into a chapterhouse of the Galenic League.

"You have Dr. Garer," the elvin young woman said. "Through there." She nodded at a porcelain-edged doorway.

"But you didn't ask my name," I said. "How do you know I'm intended as Dr. Garer's patient?"

"Whoever I chose was hers. If another had chosen you, you would have gone elsewhere."

"Everyone on the *Desideratum* has an individual doctor?" No prior briefing — and we'd had dozens — had mentioned this fact. Mentioning it would have eased many anxieties.

"Ganhk has thousands of doctors," the girl said. "And here on Doen we love every citizen of the Ommundi Commonweal."

Spoken, I thought, like an amiable little robot. But she smiled, and the light in her eyes sparked from within, not from the foyer's pale lavender wallglow.

Dr. Garer pushed aside her amanuensis screen and struggled up from behind a fortress of disc filers, research aids, and one brand-new-looking book. She seized my hands, her gray head lowered but her gray eyes searching my face. For what? A sign of my fanaticism?

"I'm Dr. Pinalat Garer, a counselor-surgeon originally from Iiol." She smiled. "Iiol is a small village west of here."

Standing a hand taller than I, she hunched her shoulders to minimize the difference. Her work jacket featured cloudpanels and a few disconcerting blue blinkthreads. In fact, it dazzled me — just as, in worshipful settings, the icons of Corderism have always done.

"And your name?" said Dr. Garer.

"Drei Roh Sfel."

"Well, Citizen Sfel — "

"Please use my friendname," I said. "Drei."

"All right," said Dr. Garer uncomfortably. She levered her amanuensis screen around to summon the Drei Roh Sfel file. It took her seven clicks to get mine (I have fortuitous namesakes on more than five Ommundi worlds), but my date of birth and the thumbnail bio authenticated the file for us.

"Do the procedure on me," I said. "Cut away my susceptibility to the God delusion."

"Easy," said Dr. Garer, pointing me to a chair. "No surgery without therapy. No therapy without empathy. No empathy without acquaintance."

"No acquaintance without intimidation," I said.

Dr. Garer looked surprised. "You were forced to enroll as an excision candidate?"

I shook my head. "Oh no. No single person compelled me. No one threatened violence, or any other penalty, if I decided to remain a, a dupe. I came freely."

"But you remain of two minds about it?"

"Of course. Lucidist views have such widespread force that one always feels the pressure to, well, to *shed* that pressure."

"Societal pressure?"

"What else?"

"Everyone feels that, Drei. You can shed some of it simply by saying 'no' to superstitious cant."

"I have to feel that 'no' before I can voice it."

"Certainly," she said.

"Meanwhile, throughout most of the Ommundi Commonweal, it's a stigmatizing thing to believe as I do."

"Which makes you a good surgery candidate. I can remove the growth responsible for your delusion, thus freeing you from any societal stigma as well."

"Ah," I said. "The rehabilitated believer."

Dr. Garer heard my sarcasm and rubbed her cloudpanels, which crackled with holofabric lightnings.

Either my long trip or Ganhk's strangeness, if not both together, suddenly undid me. I covered my mouth and fought to suppress a sob. This sob sounded, even to me, like the wheeze of a steer toppling in a slaughterhouse.

"Go ahead," Dr. Garer said. "No shame. Let it cycle."

Given permission, I wept.

"You've agreed to what you must regard as a soulectomy," said Dr. Garer. "Of course you grieve. You view the procedure less as a cure than as an assisted suicide."

I had hoped for, but not really anticipated, this degree of understanding. I looked up.

Dr. Garer said, "We honor such responses, but remember that you come to them in error, through the insidious agency of the growth that I want to remove."

"Lambs to the slaughter," I said. "Passive sheep."

Dr. Garer said, "This pathological self-abuse stems directly from the tenets of your belief system, which has its own origin in a delusional soul structure."

Bemused, I shook my head.

"Would a passive lamb have had the courage to contract for the removal of such a structure?" the doctor asked. "And to come such a distance to bring it about?"

"A stronger believer would never have admitted the need," I said. "A stronger believer — "

" — would never have come," Dr. Garer said.

"Exactly. I've surrendered to spiritual genocide. So of course I scold, I second-guess myself."

"Go on."

I said, "I see the surgery that you want to do, and that I still *think* I want done, as aborting the god-seed that makes me me. I envy your intellectual and emotional freedom, but I also envy the militant faithful, whom I've betrayed by choosing to come here."

I stopped. Was this same conversation occurring in five hundred other chapterhouses? Was Citizen Koh undergoing a similar shakedown elsewhere? If so, damn the Doenr lucidists for their ages-old strategy of Divide and Conquer.

I put my hands in my armpits. None of my fellow, or even my enemy, religionists could see or hear me, but God, I still believed, could. I appealed to the First One through the holy go-between of the Ladlamb, El Cordero.

"Praying?" said Dr. Garer.

"Trying to," I said. "Not allowed?"

Pinalat Garer chuckled brightly. "If it harms no one else, do what you feel inclined to do. After our procedure, the urge will no longer afflict you, except as a rare vestigial tic."

"Does that mean you sometimes pray?"

"A silly blurt or two during crises." Dr. Garer shook her iron-gray head in happy self-reproach. "Even lucidists still have tailbones, Drei. That doesn't make us monkeys. Not permanently, anyway."

I smiled, but, as I did, I prayed, knowing at once both peace and shame.

I SLEPT THAT NIGHT IN A ROOM OF THE CHAPTERHOUSE TO WHICH DR. Garer belonged: a room clean and spare, with a reedlike mat on one wall, a hand-held summoner, and a port through which I could view the city without yielding privacy. Ganhk did not consist solely of glassy buildings and vivid slate tiers, but also of ragleafed trees, lofty stairwalks, and a river cutting through it in a series of locks and waterfalls. Engineering rather than naked geography had made Ganhk beautiful.

Zarafise Koh — like my other steeragemates — had similar digs in other chapterhouses of the Galenic League, private rooms to which preprogrammed child guides had delivered them. Dr. Garer had advised that I spend the evening sorting my thoughts, preparing for further talk, and resting. Sleep would help me vanquish my iduum funk and my tendency to second-guess myself.

"Avoid loud music, crude teledramas, oversavory food, and recursive self-debate," she had said. "Most of which you've processed already or you'd have never come."

I longed to see Zarafise or any other Corderist. In fact, I would have happily spoken with even a turncoat mahdiac or Eastern vehiclist. I didn't believe what they believed, but I knew what the prospect of having the physical source of their faith removed felt like. Like agreeing to one's own lobotomy. Like watching a loved one jump into an annihilating flow of ice or magma. Like death and grief at the same time.

But for additional counseling sessions, my procedure could have happened on an outpatient basis. Often, on Doen, it does, for Doen has a low incidence of religious fervor. When it does occur, it occurs amid born rationalists (lucidists, as they style themselves here) who have already laid the groundwork for the patients' acceptance of the procedure and their subsequent reintegration into Sagency society.

As far as my own wounded faith would allow, then, I trusted Dr. Garer, awaiting the procedure with an odd mix of surrender and foreboding. I also prayed for El Cordero to come dwell in me throughout the lightscalpeling designed to evict Him from my person: *Help me stay the course in slaying You.*

But prayer, although I kept recommending it to others, had never counted among my own spiritual gifts. Even as a creature of faith, I fell victim to thoughts of the city outside the chapterhouse, imagining its amusements and temptations — from the aesthetic to the carnal, from the noble to the base. The summoner on my bedtable had keys for food, research aid, and the referencing of millions of sites, activities, and services planetwide. It also allowed me to set the coordinates for the screen on which the unit showed these items. I enlarged or shrank the screen, shifted it in amoeboid swoops from wall to ceiling, and dimmed or brightened it, wholly on whim, perching at the end of my bed to watch the wall or lying supine to see the strange shenanigans on the ceiling.

The screen showed me that Ganhk had crooneries (singing bistros); stairway museums; falconing tournaments; concert walks; neurotheaters; disembodiment booths; pornoporia; cafés specializing in offworld cuisines; wet-, hard-, and software shops; greenhouses; costume boutiques; lock kayaking; and roving street shrinks, among hundreds of other lures, kicks, and helps, including even a daily fishing meet on the Kivit.

I wanted to go out with a friend. I didn't want to sit like a prisoner in this resort for alien invalids trying to pray — meditate — myself to an acceptance of my soulectomy. But I was a lutemaker from a hamlet in an emerging backwater nation on the far edge of the civilized iduum, and lacked the balls to try a midnight escape.

MY FINAL SESSIONS WITH Dr. Garer began early the following morning in a revolving aerie atop the chapterhouse. The view gave me Godlike feelings, not so much of power as of awe. Dr. Garer pointed out various places and eventually diverted my attention to the red-slate ramparts west of us.

"My own village, Iiol, lies beyond those mountains," she told me. "We call them the Bloodbones."

"You hail from a mere hamlet, just as I do, and yet you came to adulthood with no spiritual training?"

"The notion that matters of the spirit belong only to those formally indoctrinated in a ritualized faith is as false as the idea that a religionist lacks intellect," she said with a trace of heat. More calmly, she added, "I don't feel estranged from creation because I deny a quasi-personal creator. Neither will you, Drei, after the procedure."

I said, "How exactly *do* you regard God?"

"As a concept, not a personality. A metaphor, not a lord to whom self-abasement is due. If I sometimes think of God in a backward or oldfangled way, I attribute it to the stress of a bad specific moment or the firing of synapses in my reptilian hindbrain. And I go on functioning as a human grown-up in sync with the rhythms of Doen as one living world amid a vast galaxy of sentient worlds."

"Whereas I don't?"

"I don't know, Drei. Most religionists — although not all — get stuck in a narrow sacral system based on an analogy with the parent-child dynamic of our own biology, itself a product of evolutionary

"If this structure exists in us, there's a reason. Cutting it out is an evil intervention."

forces. Think how arbitrary that is. And how limiting."

I gazed out at the minarets and retorts of the city. A lutemaker could follow this argument and even credit it to a degree, but it denied the possibility that God may have shaped the so-called parent-child dynamic on the narrow sacral system defining the God-human relationship. However, the mere thought of explaining this to Dr. Garer fatigued me.

"Tell me about the procedure," I said. "My procedure."

Dr. Garer used a video screen and an electronic pointer to show me the odd structure (the word *growth* exaggerates the size and the changeability of such a minuscule tumor) triggering and feeding my faith. It was more like a nit-sized speck than a nodule, more like a piece of gristle than a cyst. It grew on the interior of my left lung, very near the heart. From it there radiated — if only on the 3-D raychart — a targetlike aura of yellow and flame. The rings about the bud of my faith were many times larger than the tiny bull's-eye at their center.

"Air and blood," I said, fastening on the tumor's proximity to both lungs and heart.

"You're remarking on its location," Dr. Garer said. "That's fine. Except that after Dr. Uten Venlet developed his original theographic techniques, he discovered that the structure popped up in different places in different patients, from the cerebral cortex to the genitals. Last year, I found one behind the knee of a sullen Kozlukti nun."

"If she'd had her leg amputated," I said as a tease, "would she still've needed your procedure?"

"Oddly, yes. The structure has latent subsidiaries that may crop up almost anywhere."

"Then how can your procedure truly rid anyone of faith?"

"By its thoroughness. Also, we never perform it without intense before and after counseling."

"Like this?"

"Like this," she said.

Looking down, I saw naked children thrashing in a lock of the Kivit River, in a nook of the banking complex, under a tree with boughs like huge beige culverts and leaves like tattered green scrolls. Nearby, adults cast lines into the water and extracted on bronze lures river creatures more like featherless birds than trout.

"So when do I have it?" I said.

"Day after tomorrow, if you keep making progress. Do you still want it?"

"I think so. One favor, though."

"What's that?"

"An evening out with a fellow Corderist. You've separated us, I think, to ensure our biddability as converts."

"I'm sorry, Drei. That just isn't so."

"Then let me see her this evening."

"Who?"

"Zarafise Koh." Another evening under chapterhouse arrest, I added, would drive me crazy.

"I'm glad to agree," Dr. Garer said. "And maybe tomorrow you and Citizen Koh will visit my homeplace in Iiol."

My eyes betrayed my suspicion.

"To prove we don't keep you confined to some evil end," she said. "To show how one devoid from birth of God possession can live, and live richly."

THAT EVENING, ZARAFISE AND I STROLLED THROUGH GANHK. WE RENTED lines, sonic spinners, and a small Kivit pool under a moonlamp. Here we angled for a type of Doenr riverlife called goldfinch. This name, the rental man said, was a pun, albeit one opaque to us. The water, though, had an ebony depth allowing blurred vision to the bottom: fins, wings, flukes, streamers, eyespots, scales, maybe even slippery vestigial feet. Zarafise had an earache and a blister inside her lip. The earache stemmed from her body's failure to adjust to local gravity and barometric pressure, the blister from worry.

"What is it?" I said.

"I'm refusing the procedure," she said. "You should too."

"Why?" (Here we went again.)

"If this structure exists in us, there's a reason. Cutting it out is an evil intervention."

"Name the reason for the appendix. Or the tailbone. Or my own useless extra nipple." To shock her out of her inflexible piety, I pulled up my tunic and drew an invisible circle around a wen on my so-called milkline. Zarafise slapped my hand down.

"Stop that!"

"People here swim naked," I said. "I doubt a blemish on my skinny flank will offend them."

Zarafise cast her line and quickly pulled in a goldfinch, which glittered as if with hammered coins. I helped land, unhook, and release it, putting her three catches up on me.

"What will you do?" I said.

Zarafise, once she had made up her mind, rarely recanted a decision. "Begin working off the cost of my error. I have a job in the chapterhouse."

"A job a machine could do better," I said. "It'll take you years to pay off your debt."

"As I work, I'll testify. This was the Ladlamb's plan for me from the beginning."

"Sagence tolerates but doesn't encourage the God-stricken," I said. "You'll have a hard time here."

"I've known harder times in harder places."

We left the banks of the Kivit for another stroll, this time to gawk numbly at the city's architecture, a melange of functionalism and fantasy, serviceable rectangular structures wedged amongst the tall sinuous bottles so conspicuous from the spaceport. The light of seven moons twinkled from or leaked through the city's pastel bridgeways, domes, and spires. Many pedestrians wore polarized eyeglasses.

"No churches," said Zarafise Koh. "No cathedrals."

"Did you really expect any?"

"Not even their gutted shells. At least on a world with a bona fide history, Drei, you get their petrified remains."

"Other structures stand in for them."

"Like what?"

"Hospitals," I said. "Art galleries. Chanceries."

"The sick die hopeless, the pictures lack substance, the ceremonies ring hollow."

"That's the bias of a zealot," I said. "Ganhk strikes me as joyous, alive."

"You don't need the procedure," Zarafise said. "Dr. Garer has already performed it on you."

Not so. But our counseling sessions and my recent exposure to Ganhk's charms had prompted me to defend the place.

"I've had enough," Zarafise Koh said.

I took her back to the chapterhouse in which she'd spurned her role as patient for the roles of an indentured servant and a secret agent for the Ladlamb. Then I returned to the Kivit (rejecting prayer much as Zarafise had rejected the procedure) and had a strip of broiled goldfinch with a mug of Sagency mead. I had thought to debauch myself in one or two of Ganhk's pleasure spots, but that

"The *act* of dying holds terror for me, especially if it occurs away from help. But *being* dead? That's nothing."

raw urge had flown and I hiked back to my chapterhouse well before midnight.

THE NEXT DAY PANALAT GARER AND I TRAVELED BY MAGNETRAIN TO Iiol. She wore sandals, a voluted blue wrapsuit, and a wide snood in which her iron-hued hair swung gently. Sitting beside her as our train hummed through a cut in the Bloodbones, I felt like a truant schoolboy. It rained as we hurtled along. Somewhere toward the front of our car, a young man crooned:

"This magnetrain
Calls the magnet rain,
And all who deign
To drink it again
Have surcease of pain
On their travels amain!"

I LIKED THIS MAN'S TENOR AND LONGED to accompany him on a lute of my own making. His song had three more stanzas, none very original or cogent, but his voice transfigured them. I heard the sacred in that voice. Dr. Garer tapped her knee, but probably heard only his lilting tenor, the swift schussing of the train, a billion ricocheting raindrops.

In Iiol, we walked in this downpour through an orchard of toadstool-shaped treehouses to Panalat Garer's girlhood home, where her father and mother still lived: Girmisur and Dulatod Garer, old Sagency with frank eyes and straight backs, dressed for our arrival in silken capes and culottes.

They greeted us, gave us bread, soup, and ale, and withdrew up a helical wooden staircase to a loft in the cap of their house. Thick forest grew about, but among the trees were other such houses. Iiol itself tumbled down the hillside below, an array of shingled shops and kiosks.

"This is my room," Dr. Garer said, pointing me to a chair.

By her room, she meant not merely a dormitory but a living space redolent of her personality. It boasted paintings, toys, paperweights, a dulcimet, books, slate sculptures, holograms, rainstaves: items that had helped formulate or that currently amused her adult self. These things — not so much things as precious totems — shut out the outside world without turning the room itself into a prison cell.

"Cozy," I said. "A kind of shrine to you."

"Far from it," Dr. Garer said. "Shrines mummify and honor, but this place gives me a kick in the seat."

"Your parents don't use it while you're in the city?"

"Yes, they do, but they try to keep it neat for me."

"They idolize you."

"Again, far from it. They respect me for who I am and what I've done. I'm their posterity, as my work is mine."

"Dying holds neither terror nor hope for you."

"The *act* of dying holds terror for me, especially if it occurs away from help. But *being* dead? That's nothing."

"What hope in utter nonexistence?"

"Perfect peace," said Dr. Garer. "Why would anybody want the turmoil of hell or the boredom of your Corderist heaven?"

I stayed mute. In fact, I could not envision an afterlife, although God, as drover and deliverer, still seemed to me not only an option but a prerequisite. I didn't want my First One to stand in that capacity, though, especially if my conviction on that point convicted me of foolishness or delusion among my freethinking peers. Zarafise Koh did not feel that way, of course, but she would spend the remainder of her life a captive of her Corderism and a servant of the Sagency.

"Take a walk or a nap," Dr. Garer said. "Do as you like."

A soft rain still fell, so I stayed indoors flirting with a nap. Panalat Garer moved about quietly. At length she took up her dulcimet, to play the song of the man on the magnetrain. Music filled the study, drenching me in warm impalpable light.

Lightning blasted the toadstool house nearest the Garers' or, rather, the antenna atop it. A crack of thunder concussed the air and the trees, rattling the house's windows. The air glowed. The hair on my arms did a brief writhing dance. Iiol was not Ganhk, nor Ganhk Iiol, and suddenly the lucidism of the city felt fragile and remote.

From the Garers' loft, a cry: *"O storm storm storm!"*

"Shhhhhh," someone hissed. "Shhhhh."

Panalet Garer and I stepped from her room to look up the staircase. Girmisur Garer came pounding down it. He had shed his cape and hiked up his emerald-green culottes. His dugs swung on his chest like heavy ivory balloons. Blue veins and red streaks marbled his flesh, which jounced as he landed on his big ugly feet at the bottom.

Dr. Garer rushed over and took her father by the shoulders: "Chaba, it's only a thunderstorm. Steady yourself."

"I know," he said; however, he didn't seem to care. The whites of his eyes had the size and the plushness of meringues.

"Go back upstairs, Chaba. Put on your cape."

Thunder spoke again, grumbling above Iiol like an air force of giant saurians. The woods quaked, as did Iiol and the sunset side of the Bloodbones.

Cried Girmisur: "O storm storm storm!" He stripped off his culottes and darted outside in only a loincloth.

"Girmisur!" called Dulatod. *"Girmisur!"*

"Stay here, Mezi," Dr. Garer said. "We'll get him."

Girmisur preceded us into an evergreen thicket, heedless of strewn cones and needles. He broke off two branches thick with gum and held us at bay, flapping them menacingly.

"Chaba, lay the branches down. Come back inside."

He ignored Dr. Garer and trotted up the hillside between toadstool houses and trees onto an apron of scree that rose on a long slope to the peak. Trotting, he brandished his fronds and struggled to stay upright. Amazingly, three other geezers from Iiol, one baby-naked but skeletal, had reached the scree and started up it carrying branches. Eventually, Girmisur and the others reached a ridgeline of crimson slate and stood on it four abreast, staring down at us with awe-stricken eyes.

"Who are they?" I said. "What're they doing?"

"A rain dance," Dr. Garer said. "They're educated rustics like my chaba. They understand their folly, God forgive them."

Naked or nearly naked, Girmisur and his friends looked like elderly chimps in the throes of an elemental madness. Each thundercrack provoked them. Girmisur or another rushed partway down the slope, toppled, cut himself, and struggled back up to the ridgeline, where

Continued on page 95

Welcome to "The Saddle Point Sequence." Three new linked stories. One new universe. It all begins here.

A PASSENGER IN THE HOPE-3 TUG, REID Malenfant descended toward the far side of the Moon.

The lunar base, called Edo, was a cluster of concrete components — habitation modules, power plants, stores, manufacturing facilities — half-buried in the cratered plain. Comms masts sprouted like angular flowers. The tug pad was a splash of scorched moondust concrete a couple of kilometers out. Around the station itself, the regolith was scarred by tractor traffic.

Robots were everywhere, rolling, digging, lifting; Edo was growing like a colony of bacilli in nutrient.

A *hi-no-maru*, a Japanese sun flag, was fixed to a pole at the center of Edo.

Gaijin

PART 1

BY STEPHEN BAXTER

Illustration by Janet Aulisio

"You are welcome to my home," Nemoto said.

She met him in the pad's airlock, a large, roomy chamber blown into the regolith. Her face was broad, pale, her eyes black; her hair was elaborately shaved, showing the shape of her skull. She smiled, apparently habitually. She could have been no more than half Malenfant's age, perhaps thirty.

Malenfant felt disoriented, restless. He was here to deliver an invited lecture on colonizing the Galaxy, to senior executives of Kawasaki Heavy Industries. But here he was being met off the tug by this kid Nemoto, the junior researcher who'd invited him out here.

He hoped he wasn't making some kind of fool of himself, here. Malenfant was sixty years old; as he'd grown older he'd become aware of the increasing importance of his dignity to his fragile ego.

Nemoto helped Malenfant don the suit he'd been fitted with during the flight from Earth. The suit was a brilliant orange. It clung to him comfortably, the joints easy and loose.

"It's a hell of a development from the old EMUs I wore when I was flying Shuttle," he said.

Nemoto told him it had been manufactured on the Moon, and was made largely of spider silk. "I will take you to the factory. A chamber in the lunar soil, full of immense spinnerets. A nightmare vision! ... "

They stepped through a transit tunnel, and directly into a small tractor. The tractor was a platform mounted by a bubble of tinted glass.

The tractor rolled away from the tug pad. The wheels were large and open, and absorbed the unevenness of the mare; Malenfant felt as if he were riding across the Moon in a soap bubble. And every surface in the cabin was coated with fine, gray moondust. He could smell the dust; it was like wood ash.

Beyond the window, the Mare Ingenii — the Sea of Longing — stretched to the curved horizon, pebble-strewn. It was late in the lunar afternoon, and the sunlight was low, flat, the shadows of the surface rubble long and sharp. The lighting was complex: a rich tan when he looked away from the Sun, a more subtle gray elsewhere, as if the surface was somehow polarized. Earth was invisible, of course, but Malenfant could see a comsat crawl across the black sky.

Reid Malenfant used to be an astronaut. He'd flown the last Shuttle mission — STS-154, on *Discovery* — when, fifteen years ago, the space transportation system had reached the end of its design life. No American had flown into space since — save as the guest of the Japanese, or ESA.

Well, he thought, whatever the dubious politics, whatever the threat to his dignity, he was here. It had been the dream of his long life to come here. Even if it was as the guest of a Japanese.

But he was too damn old. The gravity's so weak that with every step I feel as if I'm falling. And the data bandwidths out here are thinner than clogged arteries .... It will be real hard to get any work done.

Nemoto locked in the autopilot and went to a little galley area. She emerged with green tea, rice crackers, and dried *ika* cuttlefish. Malenfant wasn't hungry, but he accepted the food; such items as the fish were genuine luxuries here, and he knew Nemoto was trying to honor him.

The motion of the tea, as she poured it in the one-sixth gravity, was complex, interesting.

"I am honored you have accepted my invitation to travel here, to Edo," Nemoto said. "You will of course tour the complex, as you wish. There is even a Makudonarudo here. A McDonald's. You may enjoy a bifubaaga! ... soya, of course. I hope you will be comfortable, during your stay."

Before this bright, confident girl, he felt weak and ineffectual. He put down his plate, and tried to meet her direct gaze. "I think you ought to tell me why I've been brought out here. I don't see how my work, on long-term space utilization, can be of real interest to your employers, Kawasaki Heavy Industries."

"It is not."

"Then I don't understand."

"It is I who invited you, who arranged the funding. You ask why. I am a researcher, like you."

"Hardly a researcher," he said. "I call myself a consultant, nowadays. I am not attached to a university."

"Nor I. Kawasaki Heavy Industries pays my wages; my research must be focused on serving the corporate objectives of Kawasaki." She eyed him, and took some more fish. "I am *salariman*. A good company worker, yes? But I am, at heart, a scientist. And I have made some observations which I am unable to reconcile with the accepted paradigm. I searched for recent scientific publications expressing a hypothesis similar to my own. I found only yours ....

"My subject is infrared astronomy. At our research station, away from Edo, the company maintains radiometers, photometers, photopolarimeters, cameras. I work at a range of wavelengths, from twenty to a hundred microns. Of course a space-borne platform is to be preferred. The activities of man are thickening the Moon's atmosphere with each passing day. But the lunar site is cheap to maintain, and is adequate for the company's purposes. Infrared astronomy is a powerful tool in the study of asteroids. We can deduce a great deal about surface textures, compositions, internal heat, rotation characteristics — "

"Tell me about your paradigm-busting hypothesis."

"Yes." She sipped her green tea. She said calmly, "I believe I have observational evidence of the activity of extraterrestrial intelligences in the Solar System."

THE SILENCE STRETCHED BETWEEN THEM, ELECTRIC. HER WORDS WERE shocking, quite unexpected.

He tried to figure how to deal with this, what to say. Nemoto wasn't like the Japanese he had known before, on Earth, with their detailed observance of *reigi* — the proper manner.

She studied him, evidently amused. "You are surprised. Startled. You think, perhaps, I am not quite sane to voice such speculations. You are trapped on the Moon with a mad Japanese woman. The American nightmare!"

He shook his head. "It's not that."

"But you must see that my speculations are not so far removed from your own published work."

That was true, of course. Since his retirement from NASA, Malenfant had avoided following his colleagues into lucrative aerospace executive posts and junior political positions. Instead, he'd thrown his weight behind research into long-term thinking: SETI, using gravitational lensing to hunt for planets and ET signals, advanced propulsion systems, schemes for colonizing the planets, terraforming, interstellar travel. He was making a minor living on the lecture circuit. But he had attracted more knee-jerk criticism than praise, or thoughtful response; in the last few years, he'd become regarded as not much more than a reliable talk-show crank.

"You're right," he said heavily. "But I wouldn't be so blunt about it."

"Your nation has turned inward," Nemoto said. "Shrunk back."

"Maybe. We just have different priorities now," he said. "Heavy engineering, heroic flights to the Moon ... that's all back in the last century, for us." In the United States, flights into space were dreams of old men and women, a type of sublimated warfare which had left behind only images of charmingly antique rocket craft, endlessly copied around the Net. Nothing to do with *now*.

She said, "Then why do you continue, to argue, to talk, to expose yourself to ridicule?"

"Because — " *Because if nobody thinks it, it definitely won't happen.*

She was smiling at him; she seemed to understand. She said, "The *kokuminsei*, the spirit of your people, is asleep. But in you, and perhaps others, curiosity burns strong. I think we two should defy the spirit of our age. Share our findings, on the anomalies we have observed."

"Why?"

"I am seeking to resolve a *koan*," she said. "A conundrum that defies logical analysis." Her face lost its habitual smile, for the first time since they'd met. "Because I am uncertain I am interpreting my data correctly. I need a fresh look — a perspective from a big thinker — someone like you. And —"

"Yes?"

"Because I am afraid, I think," she said. "Afraid for the future of the species."

The tractor worked its way across the Moon, following a broad, churned-up path. Nemoto offered him more food.

THE TRACTOR DREW UP TO AN AIRLOCK AT THE OUTSKIRTS OF EDO. A big NASDA symbol was painted on the lock. NASDA for Japan's National Space Development Agency.

Here, at its periphery, Edo was functional. The walls were bare, of fused, glassy regolith. Ducts and cables were stapled to the roof. Peo-

ple — men and women, no children here — wore plain, disposable paper coveralls.

There was an air of bustle, of heavy industry. It was as Malenfant imagined a manufacturing plant in America might have appeared in, say, 1960, the year Malenfant was born. Sixty years later, there were virtually no major manufacturing facilities operating on the North American continent. So the atmosphere was quite foreign to Malenfant.

She led him through Edo, a gentle guided tour. "Of course the station is a great achievement," she said. "No less than ninety-five flights of our old H-2 rockets were required to ferry accommodation modules and power plants here. We build beneath the regolith, for shelter from solar radiation. We extract oxygen from the rocks and water ... "

At the center of the complex Edo was a genuine town. There were public places: bars, where the people could buy rice, soup, fried vegetables, *sushi*, *sake*. There was even a tiny park, with shrubs and bamboo grass; a child played there with his parents. She smiled at his reaction. "At the heart of Edo, ten meters beneath lunar regolith, there are cherry trees. Our children study beneath their branches. You may stay long enough to see *ichi-buzaki*, the first state of blossoming."

Malenfant saw no other Westerners. Most of the Japanese nodded politely to him and Nemoto. Many must have known Nemoto — Edo supported only a few thousand inhabitants — but none engaged her in conversation. His impression of Nemoto as a loner, rather eccentric, was reinforced.

As they passed one group he heard a man whisper, "*Wah! — gaijin-kusai.*"

Gaijin-kusai. The smell of foreigner. There was laughter.

EDO KEPT TOKYO TIME.

Malenfant spent the night in what passed for a *ryokan*, an inn. His apartment was tiny; the living room looked as if it doubled as a bedroom. But, despite the bleak austerity of the fused-regolith walls, the room was decorated Japanese style. The floor was *tatami* — rice straw matting — polished and worn with use. A *tokonoma*, an alcove carved into the rock, contained an elaborate Net interface unit; but the owners had followed tradition and had hung a scroll painting there — of a dragonfly on a blade of grass — and some flowers, in an *ikebana* display. The flowers looked real.

In this tiny room, he was immersed in noise: the low, deep rumblings of the artificial lungs of the colony, of machines ploughing outward through the regolith. It was like being in the belly of a huge vessel, like a submarine. Malenfant, used to the stillness of America, thought wistfully of his own study: bright Iowa sunlight, his desk, his equipment. He slept badly.

" ... HOW ARE WE TO POPULATE THE GALAXY? IT'S ACTUALLY ALL A question of economics." A Virtual projected in the air of the little theater, above the heads of the small audience. Malenfant saw their faces turned up in the image's light, like coins.

The image was a simple schematic of stars, randomly scattered. One star blinked, representing the Sun. Malenfant said, "We will launch unmanned probes." Ships, little dots of light, spread out from the Sun. "We might use ion rockets, solar sails, gravity assists — or nuclear pulse rockets powered by helium-3, mined here, on the Moon. The first wave will be slow, no faster than we can afford. It doesn't matter. Not in the long term.

"The probes will be self-replicating: Von Neumann machines, essentially. Universal constructors. Humans may follow, by such means as generation starships. However it would be cheaper for the probes to manufacture humans in situ, using cell synthesis and artificial womb technology." He glanced over the audience. "You wish to know if we can build such devices. Not yet. Although your own Mitsubishi Electric have a partial prototype." At that there was a stir of interest, self-satisfied. "We are limited by information processing, not the mechanical technology.

"Here is the heart of the strategy," he said. The little probe-images had reached their destination stars. "A target system, we assume, is uninhabited. We can therefore anticipate massive and destructive exploitation of the system's resources, without restraint, by the probe. Such resources are useless for any other purpose, and are therefore economically free to us."

More probes erupted from each of the first wave of target stars, at greatly increased speeds. The probes reached new targets; and again, more probes were spawned, and fired onward. The volume covered by the probes now grew rapidly; it was like watching the expansion of gas into a vacuum.

He said, "Once started, the process is self-directing, self-financing. It would take, we think, ten to a hundred million years for the colonization of the Galaxy to be completed in this manner. But we must invest merely in the cost of the initial generation of probes. Thus, the cost of colonizing the Galaxy would be less, in real terms, than that of our Apollo program of fifty years ago ... "

His Japanese audience watched politely.

The probes spread out along the Galaxy's spiral arms, along lanes rich with stars.

There were few questions. He stared around at the rows of shining Japanese faces; they seemed remote, unreal. Many of these people were NASDA administrators; as far as he could tell there was nobody of a senior management position here from Kawasaki, nominally his sponsors for the trip.

They applauded him kindly enough.

He got out, feeling foolish. What the hell was an American doing here on the Moon, lecturing these patient Japanese about colonizing space? The Japanese, here, were *doing* it, patiently and incrementally working. The contrast with modern America — placid, introvert — couldn't have been greater. *Perhaps*, he thought, *the species has reached a bifurcation. One branch reaching for other worlds, the other turning inward on itself. A century ago, no one would have anticipated the roles taken by America and Japan in such a bifurcation. In another century, we may not recognize each other.*

THE NEXT DAY NEMOTO SAID SHE WOULD TAKE HIM TO THE SURFACE, to see her infrared spectroscopy results at first hand. They walked through the base to a tractor airlock, and suited up once more. The IR station was an hour's ride from Edo.

A kilometer out from Edo itself, the tractor passed one of the largest structures Malenfant had yet seen. It was a cylinder perhaps a hundred and fifty meters long, ten wide. It looked like a half-buried nuclear submarine. The lunar surface here was scarred by huge gullies, evidently the result of strip-mining. Around the central cylinder there was a cluster of what looked like furnaces, enclosed by semi-transparent domes.

"Our fusion plant," Nemoto said. "Edo is powered by the fusion of deuterium, the hydrogen isotope, with helium-3."

Malenfant stared out with a morbid interest. Here, as in most technological arenas, the Japanese were way out ahead of the U.S.A. Twenty percent of the U.S.'s power now came from the fusion of two hydrogen isotopes, deuterium and tritium. But hydrogen fusion had turned out to be unstable and expensive. High-energy neutrons smashed through reactor walls, making them brittle and radioactive.

But the Japanese helium fusion process, by contrast, produced charged protons, which could be kept away from reactor walls with magnetic fields.

However, the Earth had no natural supply of helium-3.

Nemoto waved a hand. "The Moon contains vast stores of helium-3, locked away in deposits of titanium, in the top three meters of the regolith. The helium has come from the Sun, borne on the solar wind; the titanium has acted like a sponge, soaking up the helium particles. We estimate we have a million tonnes of helium-3, here on the Moon. We plan to begin exporting the helium to Earth —"

"I know." The export would make Edo self-sufficient.

"But we think of the Moon as more than a strip mine," she said

now. "This is a *world*. We have so often ignored the Moon. It is perhaps too close — not far enough away to be a real world — and too familiar. But its solar insolation is, of course, identical to Earth. A terraformed Moon would be a blue twin of Earth —"

"Whoa," he said. "You're seriously talking about terraforming the Moon?"

"Why not? The problems are large, of course. The Moon must be spun up, volatiles imported. But we are studying a number of scenarios ... " She smiled brightly, young and confident in the future.

Out of sight of Edo, the tractor passed a cairn of piled-up maria rubble. On the top there was a sake bottle, a saucer bearing rice cakes, a porcelain figure. There were small paper flags around the figure, but the raw sunlight had faded them. Malenfant asked Nemoto about the cairn.

"It is a shrine," she said. "To Inari-samma. The Fox God." She grinned at him. "If you close your eyes and clap your hands, perhaps the kami will come to you. The divinities."

"Shrines? At a lunar industrial complex?"

"We are an old people," she said. "We have changed much, but we remain the same. *Yamato damashi* — our spirit — persists."

At length, the tractor drew up to a cluster of buildings, set on the plain. This was the Kawasaki Heavy Industries infrared research station. Nemoto checked Malenfant's suit, then she depressurized the tractor.

Malenfant climbed stiffly down a short ladder. He dropped down the last meter; his small impact sent up a little spray of dust, which fell back immediately.

And there he was, walking on the Moon.

His spider-web Japanese spacesuit was a warm shell around him, light and flexible; he heard the hiss of air, the soft whir of the exoskeletal multipliers that helped him overcome the suit's pressurization. His helmet was a big gold-tinted bubble that gave him three-hundred-and-sixty-degree vision.

The Moon was a sphere, tight and compact, full of subtle color. The landscape was sharp, right to the horizon; when he looked away from the tractor, away from Nemoto's little base, there were no landmarks — no trees, no buildings, no atmospheric mist — and it was hard to judge distances.

He walked away from the tractor, looking for virgin regolith. He had to go perhaps a hundred meters to get away from the tractor tracks and footsteps.

He reached unmarked soil. His boots left prints in crisp regolith, as fresh as if he had stepped out of *Apollo* 11. The regolith was peppered with crystals of pyroxene and feldspar, yellow-brown and white. There were craters of all sizes, right down to tiny zap pits in the crystals.

He looked back at the tractor, with the big red sun of Japan painted on its side. He thought of a terraformed Moon, of twin blue worlds. He felt tears, hot and unwelcome, prickle at the back of his eyes. *Damn it. We were here first. We had all this. And we let it go ....*

Nemoto waited for him, her face hidden behind her gold-tinted bubble of glass.

SHE LED HIM INTO THE CLUSTER OF BUILDINGS. THERE WAS A SMALL fission power plant, tanks of gases and liquids. A living shelter was half-buried in the regolith.

The center of the site was a crude cylindrical hut, open to the sky, containing a battery of infrared sensors and computer equipment. The IR detectors themselves were immersed in huge vessels of liquid helium. Robots crawled between the detectors, monitoring constantly, their complex arms stained by moondust.

Nemoto walked up to a processor control desk. A Virtual appeared, hovering over the compacted regolith at the center of the hut. The Virtual was a ring of glistening droplets of crimson, slowly orbiting. "Here is a summary of my survey of the asteroid belt. Or 'belts,' I should say, for there are gaps between the sub-belts — the Kirkwood gaps, swept clear by resonances with Jupiter's gravity field." The Kirkwood gaps were dark bands, empty of crimson drops.

"What does Kawasaki Heavy Industries care about asteroids?"

She faced him. "Your narrowness of understanding is distressing. It is a symptom of the over-specialization of our times. There is a mine in Sudbury, Ontario, which for a long time was a rich source of nickel. The nickel seam is disk-shaped. It is almost certainly the scar of an ancient asteroid collision with the Earth ... "

"Mineral extraction, then."

"There is a scheme to retrieve a fragment of the Earth-crossing asteroid Geographos. We may cleave it with controlled explosions. Perhaps we can deliver fragments to orbit, using lunar gravity assists and grazes against the Earth's atmosphere. Or we may initiate a controlled impact with the Moon. This exercise alone would yield more than nine hundred billion dollars' worth of nickel, rhenium, osmium, iridium, platinum, gold ... "

Malenfant walked around the instrument hut. The novelty of his moonwalk was wearing off; his suit scratched, his helmet was hot, and his condom was itching. "Your equipment is just so much hardware," he complained. "You could have shown me a Virtual of it back in Edo. You could have shown me a Virtual on Earth. Why am I here?"

"The *koan*," she said. The Virtual shone in her visor, making her face invisible. "What I have to tell you is strange. Perhaps it is unbelievable. But I had to bring you here, away from Earth. Away from the babble of other people's thinking." She said, "In your talk you described a grand strategy, for populating the Galaxy. Now: If we can conceive such colonization strategies, why not another race, on a world circling another star? What if they are coming? *What if they are already here*?"

What has Nemoto found? "Another intelligence ... it would be wonderful. I guess."

"Would it?" She smiled. "How sentimental you are. Listen to me: Humanity would be in extreme danger. Remember, by your own argument, the assumption on which such a probe operates is that it is appropriating an empty system. Such a probe could destroy our Solar System without even looking for us."

He shivered; his spider-web suit felt thin and fragile.

"Think it through further," she said. "If an alien replicator were to approach the Solar System, where would it seek to establish itself? What are its requirements?"

He thought about it. *You'll need energy; plenty of it. So, stay close to the Sun. Next: raw materials. The surface of a rocky planet? But you wouldn't want to dip into a gravity well if you didn't have to ... Besides, your probe is designed for spaceflight* — "The asteroid belt. Resources, freely floating, away from deep gravity wells ... and you'd settle in a Kirkwood gap, to minimize the chance of collision." He looked at her sharply. "Is that what this is about? Have you found something in the belt?"

"The plain facts are these. I have surveyed the Kirkwood gaps with the sensors you see here. And, in the gap which corresponds to the one-to-three resonance with Jupiter, I have found —" She pointed to her Virtual model, to a broad, precise gap.

At the center of the gap, a string of rubies shone, enigmatic, brilliant.

"These are sources of infrared," she said. "Sources I cannot explain."

Malenfant bent to study the little beads of light. The images cycled with small vector arrows, which showed velocity and acceleration. The rubies weren't in simple orbits about the Sun, he saw; they seemed to be spreading around the belt, some of them actually moving retrograde, against the motion of the rest of the belt.

The motion was intriguing. As an ascan at Houston he'd studied a lot of celestial mechanics; he imagined long-buried subroutines in his subconscious working on this data, speculating, looking for patterns ....

He said, "Could they be asteroids that have strayed into the gap, after a collision?"

"No. The sources are too strong. In fact, *they are each emitting more heat than they receive from the Sun*. I am, of course, seeking firmer evidence. For example, structure in the infrared signature; or perhaps there will be radio leakage .... "

He stared at the little ruby lights. *My God. She's right. If these are emitting heat, this is unambiguous: It's evidence of alien industrial activity in the asteroid belt .... Here on the Moon, the Japanese have*

found aliens. He had a sudden, extraordinary vision, an amalgam of century-old fantasies: *an excavation on the Moon, an exposed sentinel, an artifact of aliens ... but the pit was surrounded by Japanese voices, not American.*

Then, in this moment of enlightening, new connections formed in his mind, fragments of ideas propagating like galactic probes.

Suddenly, the pattern seemed to leap out at him.

"Nemoto — have you analyzed the pattern of propagation of these things?"

She hesitated. "I ... no. I've concentrated on the infrared signature, which —"

He bent, and pointed to the little velocity arrows. "Look at this. See the pattern? Imagine the arrows projected backward."

"Ah," Nemoto said. "Yes. They might converge."

Malenfant hurried to the hut's processor console; Nemoto followed. Together they accessed the raw data behind Nemoto's display, and set up a routine to extrapolate back from the velocity vectors.

It was rough and ready. They had to make a lot of assumptions about how the objects' trajectories had deviated from simple orbits through the Sun's gravitational field. But, before long, they had an answer.

Malenfant tapped a screen. "There it is. The prime radiant. Where these probes, or factories, or whatever the hell they are, are emanating from."

Nemoto bent to see. "One point four times ten to power fourteen meters from the Sun." She frowned. "That is —"

"About a thousand astronomical units out. Somewhere in the direction of Virgo."

They walked out of the hut. Nemoto looked up toward the Sun, and its light flooded her helmet. "But why there?"

"The solar focus," he said.

"The what?"

"That far out is where you'll find the focal points of the Sun's gravitational field. Images of remote stars, magnified by gravitational lensing. I don't know what's going on out there. But I'm sure that can't be a coincidence."

Nemoto said grimly, "So. It is true. Our *koan* is resolving .... Should we send probes to the belt?"

"I guess. But that won't answer the fundamental questions. We've got to send somebody out there, to the prime radiant. Through a thousand AU; out to the solar focus .... We'll need the resources of the race, of all of us, to fight this."

"Yes. The stars have intervened, it seems. Your *kokuminsei*, your people's spirit, must revive. It will be *satori* — a reawakening. You must imagine the future, as you did before."

"Yes," he said. "This changes everything."

"Come." She held out her hand. "We should go back to Edo. We have much to do."

He squinted, trying to make out the constellations against the glare of the regolith, looking for Virgo.

There was *gaijin-kusai* there, the smell of foreigner, he thought. But soon the *gaijin* would be hunted, to the heart of the nest it was building. And when its cousins came, humans would be ready.

He felt exhilarated, awakened, as if a fifteen-year hiatus was coming to an end. *This changes everything.* He took Nemoto's hand, and they walked across the regolith to the tractor.

Saddle Point

PART 2

DISCOVERY LOOPED THROUGH AN ELLIPTICAL, two-hour orbit around the Moon. On the surface, the lights of the Japanese colonies and helium-3 mines glittered.

The ship was a stack of components fifty meters long. At its base was a massive, reinforced pusher plate, mounted on a shock-absorbing mechanism of springs and crushable aluminum posts. The main body of the craft was a cluster of fuel magazines. Big superconducting hoops encircled the whole stack.

Now pellets of helium-3 and deuterium were fired out of the back of the craft, behind the pusher plate. They formed a target the size of a full stop. A bank of carbon dioxide lasers fired converging beams at the target.

There was a fusion pulse, lasting two hundred and fifty nanoseconds. And then another, and another.

Three hundred microexplosions each second hurled energy against the pusher plate. Slowly, ponderously, the craft was driven forward.

From Earth, the new Moon was made brilliant by fusion fire.

Reid Malenfant was riding out of the Solar System.

It was three decades since Malenfant had been back to the Johnson Space Center.

The campus looked pretty much unchanged: the same blocky black and white buildings scattered over square miles of grassy plain, with those big black nursery-style

numbers on their sides, all contained by a mesh fence from the NASA Road. (But it wasn't called the NASA Road anymore.) The cherry trees were still there, though, and the green grass still seemed to glow.

He wasn't here to sight-see. He was here to meet Sally Brind, who ran the Solar System Exploration Division. He made his way to Building 31.

Inside, the air conditioning was ferocious, a hell of a contrast to the flat, moist Houston heat outside.

Reid Malenfant loomed over Brind. He was leaning on her desk, resting his weight on big, bony knuckles. He was eighty years old — twice Brind's age — and he was a legend out of the past. And, to her, he was as intimidating as hell.

"We got to get out to the solar focus," he said.

"Hello, good morning, nice to meet you, thanks for giving up your time," she said drily.

He backed off a little, and stood up straight. "I'm sorry," he said.

"Don't tell me. At your time of life, you don't have time to waste —"

"No, I'm just a rude asshole. Always was. Mind if I sit down?"

She said, "Tell me about the solar focus."

He moved a pile of glossies from a chair; they were digitized artist's impressions of a proposed, unfunded mission to Io. He sat down. "What I'm talking about, specifically, is a mission to the solar focus of Tau Ceti, which is a K-class star twelve light-years away, and similar enough to the Sun to be a possible center of a planetary system.

"The Sun's gravitational field acts as a spherical lens, which magnifies the intensity of the light of a distant star. At the point of focus, out on the rim of the System, the gain can be hundreds of millions; at the right point, it would be possible to communicate across stellar distances with equipment no more powerful than you'd need to communicate between planets ...

"Actually there is a separate focal point for each star. All roughly the same distance, because of the geometry of —"

"All right. And why do we need to go to Tau Ceti's focus?"

"Because the Eeties are out there, building something."

"Eeties?"

"I'm sorry." He ran a hand over his head; his hair was snow white, but thick and healthy. "Extraterrestrials."

She nodded, slowly. "Go on."

"We have evidence that Eeties have entered the System at the solar focus radius, out in the direction of Virgo. From there, they are sending a fleet of some kind of construction or mining craft into the asteroid belt. Sally, I have evidence for all this. Infrared signatures, showing the activity in the asteroid belt, going back twenty years." He studied her. "As you must know. If you aren't believers, here in this office, then where the hell?"

She grinned. "Of course. Actually I know all about your data. There was a lot of interest in your IR findings, when you first brought them back from that Japanese NASDA base on the Moon twenty years ago. But —"

"But people have lost interest. Because the Eeties haven't come storming into the inner System in flying saucers."

"Don't you think that's a good point?"

"Not really. Colonizing the System will take centuries, minimum."

"What do you think their intentions are?"

"Hell, I don't know. Maybe they want to dismantle the rocky planets. Maybe take apart the Sun. What would you do? They probably don't even know we're here; they probably assume the System is empty."

Oddly, in her mundane, cluttered office, she found herself shivering. "You don't actually have any direct evidence of anything out at the solar focus, do you?"

"No. Only what we've inferred from the asteroid belt data —"

"But there's no IR signature of any huge interstellar mother ship out there, at the rim. As there would have to be, if you're right."

"Hell, I don't have all the answers. We have to get out there and see. Tell the damn Eeties we're here."

"I don't see how I can help you."

"This is NASA's Solar System Exploration Division. Right? So, now we need to go do some exploring."

"NASA doesn't exist anymore," she said. "Not as you knew it, when you were flying Shuttle. The JSC is part of the Department of Agriculture —"

"Don't patronize me, kid."

"I think you have to be realistic about this. This isn't the 1960s. I'm really just a kind of curator, of the gray literature."

"Gray?"

"Studies and proposals that generally never made it to the light of day. The stuff is badly archived; a lot of it isn't yet digitized, or even on fiche .... Even this building is eighty years old. I bet it would be closed for good if it wasn't for the moonrocks."

That was true; elsewhere in this building, fifty percent of the old Apollo samples still lay sealed in their sample boxes, still awaiting analysis, after seven decades. Now that there were Japanese living on the Moon, she suspected the boxes would stay sealed forever.

"I know all that," he said. "But where the hell else am I supposed to go? You guys are the free thinkers, the conceptualizers —"

"I just want to be clear you know what you're asking of me."

"I want you to figure out how it could be done. I can get the hardware, the funding. It will all come together, once we have a viable scheme to focus on."

"Really?"

"Sure. The science will be good. After all, we still haven't sent a human out beyond the orbit of Mars. We can drop probes on Jupiter, Pluto en route. We'll get sponsorship from the Europeans and NASDA for that." NASDA was the Japanese National Space Development Agency. "The U.S. government ought to contribute, too."

"Why should they? We haven't sent a human into orbit, other than as a passenger of NASDA or ESA, in forty years."

"Otherwise," said Malenfant, "we'll have to let the Japanese do this alone."

"... True."

"Also there'll be a lot of media interest. It will be a hell of a stunt."

"A stunt is right," she said. "It would be a spectacular one-shot. Right? Just like Apollo. And look where that got us."

"To the Moon," he said severely, "thirty-five years before the Japanese."

She thought about her next words, carefully. "Malenfant, you must be aware that it will be difficult for me to support you."

He nodded. "Because I don't have a lot of credibility left. I'm thought of as an obsessive. Forty years after Shuttle was grounded, I'm still working out a kind of long, lingering disappointment about the shape of my career. I want to believe in this Eetie hypothesis, because I want us to get back into space. Right?"

"I — yes. I guess so. I'm sorry, Malenfant."

"Hell, don't be. It's true." He slapped his leathery hand on her desk. "But it's also true that the Eeties are here. Sally, I've waited twenty years for our government, any government, to act on that lunar IR evidence. They're not going to. Now, I've decided to do something, before I drop dead."

"How far away is the solar focus?"

"A thousand astronomical units." A thousand times as far as the distance between Earth and Sun.

She whistled. "You're crazy."

"Sure." He grinned, showing even, rebuilt teeth. "Now tell me how to do it."

"Do you have an astronaut in mind?"

His grin widened. "Me."

THE ACCELERATION OF THE CRAFT WAS LOW, JUST THREE PERCENT OF G. But it was able to sustain that thrust for a long time — years, in fact — and once *Discovery* had escaped lunar orbit, its velocity mounted inexorably.

Within, Reid Malenfant settled down to the routines of long-duration spaceflight.

Malenfant's first task, every day, was to swab out the walls of his hab module with disinfected wipes. Microorganisms tended to flourish, surviving on free-floating water droplets in the air.

It took long, dull hours.

His hab module was a shoebox, big enough for him to stand up straight. The walls were racks which held recovery units, designed

for easy replacement. Malenfant had brought along two of most things, and an extensive tool kit. There were wires, running along the corners of the hab module and across the walls. A robot spider called Charlotte ran along the wires, cleaning and sucking dust out of the air. There were strip lights along the edges of the box, and the color scheme had been designed to give him an up-down orientation. But that had pretty much worn away, over the years. Anyway, the *direction* of thrust was all wrong for the paintwork.

When he was done with his swabbing, it was exercise time.

Malenfant pounded at his treadmill. The machine was bolted to a bracket in the middle of the habitation module. After an hour, Malenfant found pools of sweat clinging to his chest.

Malenfant had to put in at least two hours of hard physical exercise every day. In microgravity his heart was shrinking, taking it easy. And with no gravity to pull blood down into his legs his blood distribution got pretty mixed up, with too much fluid hanging around in his head. His brain thought that was because there was too much fluid in his body, and it released a hormone telling his kidneys to make more pee. And that way lay dehydration. So Malenfant had to drink an extra four liters of fluid a day, laced with water-salt imbalance counteragents. But that extra peeing was washing calcium out of his bones. That could make his bones brittle, or give him kidney stones. So he took calcium supplements ...

On it went. Boring a hole in the sky, the old astronauts had called it.

While he worked his treadmill, his only distraction was a small round observation port, set in the pressure hull near him, and so he stared into that. To Malenfant's naked eye, *Discovery* was alone in space, now. Earth and Moon were reduced to starlike points of light. Only the diminishing Sun still showed a disk.

The sense of isolation was extraordinary.

BRIND MET MALENFANT AT KENNEDY SPACE CENTER.

Malenfant found KSC depressing; most of the launch gantries had been demolished now or turned into rusting museum pieces.

But the visitors' center was still open. The Shuttle exhibit — artifacts, photographs, and Virtuals — was contained within a small geodesic dome, yellowing with age now. And there, next to the dome, was *Columbia*, a genuine orbiter, the first to be flown in space. A handful of people were sheltering from the Florida sun in the shade of her wing. Others were desultorily queuing on a ramp to get on board. *Columbia*'s main engines had been replaced by plastic mock-ups, and her landing gear was fixed in concrete. *Columbia* was trapped on Earth, he thought.

He found Brind standing before the astronaut memorial. This was a big slab of polished granite, with names of dead astronauts etched into it. It rotated to follow the sun, so that the names glowed bright against a backdrop of sky.

"At least it's sunny," he said. "Damn thing doesn't work when it's cloudy."

"No." The granite surface, towering over them, was mostly empty. The space program had shut down, leaving plenty of room for more names.

He smiled at her. "You got any answers for me?"

"We've been through a lot of options, on ways to get you to the focus and back in a few years." She handed him a folder; he leafed through it. "It was a lot of fun, Malenfant."

"I'll bet. Gave you something real to do."

" ... Yeah. For the first time in too long. First we looked at a continuous nuclear fusion drive. Specific impulse in the millions of seconds. But we can't sustain a fusion reaction for long enough. Not even the Japanese have managed that yet."

"All right. What else?"

"Maybe photon propulsion. The ultimate exhaust velocity, right? But the power plant weight and energy you'd need to get a practical thrust are staggering. Next we thought about a Bussard ramjet. But you're looking at an electromagnetic scoop that would have to be a hundred kilometers across —"

"Cut to the chase, Sally," he said.

"Nuclear pulse propulsion. A series of microexplosions — fusion of deuterium and helium-3 probably — set off behind a pusher plate."

"Right." He nodded. "I've heard of this. Project Orion, back in the 1960s. Like putting a firecracker under a tin can."

She shaded her eyes from the Sun's glare. "Well, they proved the concept, back then. The Air Force actually ran a couple of test flights, in 1959 and 1960, with conventional explosives. And it's got the great advantage that we could put it together quickly —"

"Let's do it."

"Of course we'd need access to helium-3."

"NASDA will supply that. I have some contacts .... Maybe we should look at assembly in lunar orbit. How are you going to keep me alive?"

She smiled. "Space Station Alpha is still up there." The Station, hugely expensive and with conflicting goals, had been abandoned, partially assembled, when the funding finally ran out for U.S.-manned spaceflight. "I figure we can cannibalize a hab module for you. Have you decided what you want to call your ship?"

"*Discovery*," he said without hesitation.

"Uh huh. Why?"

"It was the last orbiter to fly. The one I landed. And besides," he said, "the name has other resonances. It's kind of appropriate, for a first contact mission."

"It's your ship." She glanced about. "Anyhow, what are you doing out here?"

He nodded at the Shuttle exhibit. "They've got my old EMU in there, on display. I'm negotiating to get it back."

"EMU?

"My EVA Mobility Unit. My old pressure suit." He patted his gut, which was trim. "I figure I can still get inside it. And I want a maneuvering unit. Maybe I can figure out how to refurbish it ..."

After two hundred and sixty days, halfway into the mission, the fusion pulse engine shut down. The three percent G faded, and Malenfant's residual sense of up and down disappeared. Oddly, he felt queasy; a new bout of space adaptation syndrome floored him for four hours.

Meanwhile, *Discovery* fired her nitrogen tet and hydrazine reaction control thrusters, and turned head over heels. It was time to begin the long deceleration to the solar focus.

Discovery, at her peak velocity now, was traveling at around seven million meters per second. That amounted to two percent of the speed of light, or fourteen hundred AU per year. At such speeds, the big superconducting hoops came into their own. They set up a plasma shield forward of the craft, which sheltered it from the thin interstellar hydrogen she ran into. This turnaround maneuver was actually the most dangerous part of the trajectory, when the plasma field needed some smart handling to keep it facing ahead at all times.

Discovery was by far the fastest man-made object ever launched, and so — Malenfant figured, logically — he had become the fastest human. Not that anyone back home gave a damn, it seemed to him.

He communicated with his controllers on Earth and Moon using a ten-watt optical laser, which gave him a data rate of twenty kilobits a second. He followed the newscasts that were sent up to him, and which he picked up with his big, semi-transparent main antenna.

As the months wore on, interest in his mission faded. Funding for the stations which communicated with him, on Earth and Moon, was squeezed.

Sometimes, there was nobody there to speak to him at all.

So he was alone out here, all but forgotten.

That suited him. It clarified the mind.

When the turnaround maneuver was done, he turned his big telescopes and instrument platforms forward, looking ahead to the solar focus.

DISCOVERY WAS ASSEMBLED IN LUNAR ORBIT.

The fuel pellets were constructed at Edo, on the Moon, by Kawasaki Heavy Industries, and hauled up to orbit by a fleet of tugs. The new components, like the pusher plate and the fuel magazine frame, were manufactured on Earth, by Rockwell-Boeing. The components were lifted off Earth by European and Japanese

boosters, Ariane 12s and H-VIIIs. The United States no longer had a heavy lift capability.

The Alpha hab module had a scuffed, lived-in look. When the salvage crew had moved in, the air had been foul and the walls covered with a scummy algae, and it had taken a lot of renovation to render it habitable again.

The various components were plastered with sponsors' logos. That didn't matter a damn to Malenfant; he knew most of his paintwork would be scoured off in a few months anyhow. But he made sure that the Stars and Stripes was large, and visible.

Malenfant prepared himself for the trip.

In her cramped office at JSC, Brind challenged him. "This is ridiculous. You're eighty years old, Malenfant."

"Yeah, but eighty isn't so exceptional nowadays. And I'm a damn fit eighty."

"It's pretty old to be enduring a three-year spaceflight."

"Maybe. But I've been following lifespan-extending practices, for decades. I eat a low fat, low calorie diet. I'm being treated with a protein called co-enzyme Q10, which inhibits aging at the cellular level. I'm taking other enzymes to maintain the functionality of my nervous system.

"I've already had many of my bones and joints rebuilt with biocomposite enhancements. Before the mission I'm going to have extensive heart bypass surgery. I'm taking drugs targeted at preventing the build-up of deposits of amyloid fibrils, proteins which could cause Alzheimer's —"

"Jesus, Malenfant. You're a kind of gray cyborg, aren't you? You're really determined."

"Look, microgravity is actually a pretty forgiving environment for an old man."

"Until you want to return to a full Earth gravity."

"Well, maybe I won't."

"Come on. You must have family."

"Sally, I married twice, and divorced both times. One of my wives is dead, the other long vanished out of my life. I've got three kids, the oldest almost sixty herself. If I never come home again, I'll miss my grandkids — and one great-grandchild — but I don't have any responsibilities left, except to myself. I'm eighty years old, for God's sake; people are living longer now, but the basic cycles of life haven't changed."

"And now —"

"And now I'm going to the edge of the System, where I expect to encounter Eeties." He grinned. "I figure I'll cross all subsequent bridges when I come to them."

"Godspeed, Malenfant," she said, chilled.

AFTER SEVENTEEN MONTHS, *DISCOVERY* SLOWED, TO A RELATIVE HALT. From a thousand AU, the Sun was just an overbright star in the constellation Cetus, and the inner System was a puddle of light.

Reid Malenfant, cooped up in his hab module, spent a week scanning his environment.

He knew he was in the right area, roughly. But the location had been deduced by tracking back the velocity vectors of Eetie factory craft sent into the asteroid belt; the precision was uncertain.

Of course, if some huge interstellar mother craft was out here, it should be hard to miss.

There wasn't a damn thing.

He went in search of Tau Ceti's solar focus. He nudged *Discovery* forward, using his RCS and occasional fusion-pulse blips.

The focusing of gravitational lensing was surprisingly tight. The radius of Tau Ceti's focal point spot was only a few kilometers, in comparison with the hundred *billion* kilometers Malenfant had crossed to get here.

He took his time, shepherding his fuel.

At last he had it. The star's image in his big optical telescope was distorted into an annulus, a faintly orange ring of light.

He recorded as much data as he could and fired it down his laser link to Earth. The processors there would be able to deconvolve the image and turn it into an image of Tau Ceti, perhaps even of any planets.

This data alone, he thought, ought to justify the mission to its sponsors.

But he still didn't turn up any evidence of Eetie activity.

A new fear started to gnaw at him. For the first time, he considered seriously the possibility that he might be wrong about this.

What if there was nothing here, after all? If so, his life, his reputation, would be wasted, a joke.

And then his big supercooled infrared sensors picked up a powerful new signature.

THE OBJECT PASSED WITHIN A MILLION KILOMETERS OF HIM.

His telescopes returned images, tantalizingly blurred. The thing was tumbling, sending back glimmering reflections from the remote Sun; the reflections helped the processors figure out its shape.

The craft was maybe fifty meters across. It was shaped something like a spider. An octagonal central unit sprouted arms, eight or ten of them, which articulated as it moved. It seemed to be assembling itself as it traveled. It wasn't possible to identify its purpose, or composition, or propulsion method, before it passed out of sight.

It was heading for the asteroid belt.

It was possible to work out where the drone had come from, though. It was a point along the Sun's focal line, further out, no more distant from *Discovery* than the Moon from Earth.

Malenfant turned his telescopes that way, but he couldn't see a damn thing.

Malenfant felt affirmed. He exulted. First contact, by damn. I was right. I can't figure out how, but there sure is something out here.

He powered up his fusion-pulse engine, one more time. It would take him twenty hours to get there.

IT WAS JUST A HOOP OF SOME KIND OF METAL FACING THE Sun. It was around a hundred meters across. There were short tubes fixed at intervals around the circumference: like guns, or lasers, pointing inward.

It was still, silent, not transmitting on any frequency, barely visible at all in the light of the point-source Sun.

Just an enigmatic artifact. There was no huge mother ship, emitting asteroid-factory drones.

He described all this to Sally Brind, back in Houston. He would have to wait for a reply. After his seventeen months' flight, he was six light-days from home.

Discovery drifted beside the Eetie hoop, with only occasional station-keeping bursts of its RCS thrusters. In the hab module, Malenfant continued with his daily routine. He still had to keep himself alive and healthy, Eetie artifact or not.

After fourteen days a message came up from Sally.

"We've had a lot of help with this, Malenfant .... As you can imagine your finding has generated a lot of interest."

He smiled at that. *Sure. Now I've hauled myself out here on a shoestring, now I'm six light-days away from home, everyone wants to help.*

"We think we have a model ... a way to explain what you've come up with. But it's very partial and incomplete. We've only had a couple of days. I wouldn't recommend going any farther until —"

He tuned her out, until she got to the point again.

"We think your hoop has to be some kind of teleportation node."

Teleportation. Right. I knew it had to be something like that. Time for a walk, Malenfant.

He shut himself up inside *Discovery*'s cramped airlock. He'd have to spend two hours in here, purging the nitrogen from his body. His antique Shuttle-class EVA Mobility Unit would contain oxygen only, at just a quarter of sea level pressure, to keep it flexible.

Malenfant pulled on his thermal underwear, and then his Cooling and Ventilation Garment, a corrugated layering of water coolant pipes. He fitted his urine collection device, a huge, unlikely condom.

He lifted up his Lower Torso Assembly; this was the bottom half of his EMU, trousers with boots built on, and he squirmed into it. He fitted a tube over his condom attachment; there was a bag sewn into his Lower Torso Assembly garment to store a couple of pints of urine. The LTA unit was heavy, the layered material awkward and stiff. *Maybe I'm not quite the same shape as I used to be, forty years ago ....*

Brind said, "The constructor artifacts you've observed, coming into the asteroid belt, must be teleported in from another location, rather than brought here by any ship. We speculate the hoop is using the interstellar medium, the thin hydrogen out there, as raw material for teleport copies .... It must be a slow process. Maybe the hoop doubles as a ramjet scoop, hauling in the material.

"If you think about it the location makes sense, Malenfant. If you are teleporting from Tau Ceti, you're basically firing a stream of complex information by conventional signal channels — that is, light — at the Sun. And the place to pick that up with greatest fidelity is Tau Ceti's solar focus. The stellar foci must be Saddle Points — places on the rim of gravity wells, linking the stars; you can imagine a network of threads, teleportation signals crossing the Galaxy ..." He could hear her smile. "We seem to be on the fringe of some kind of interstellar travel network. If it's widespread, it must be very ancient. But if teleportation is the name of the game, I guess you can rule out faster-than-light travel, or wormholes, huh? ..."

That made sense to Malenfant.

Now it was time for the HUT, the Hard Upper Torso piece. His HUT was fixed to the wall of the airlock, like the top half of a suit of armor. He crouched underneath, reached up his arms, and wriggled upward. Inside the HUT there was a smell of plastic and metal. He guided the metal rings at his waist to mate and click together. He fixed on his Snoopy flight helmet, and over the top of that he lifted his hard helmet with its visor, and twisted it into place against the seal at his neck.

He studied himself in the mirror. The EMU was gleaming white, with the Stars and Stripes still proudly emblazoned on his sleeve. He still had his final mission patch stitched to the fabric, for STS-154. *Looking pretty good for an old bastard, Malenfant.*

He opened the airlock's outer hatch.

" ... We used to think teleportation was impossible, because you'd need to map the position and velocity of every particle making up the artifact. And that violates the Uncertainty Principle.

"But it turns out there's a way around the Uncertainty Principle. Sort of ... This is all just a mind-game, Malenfant, but we do know one way to do this. An unknown quantum state can be disassembled into, then later reconstructed from, purely classical information and purely non-classical Einstein-Podolsky-Rosen correlations ...

"I'm sorry for the jargon, Malenfant. Look, quantum mechanics allows for the long-range quantum correlation of particles. Once they've been in contact, they're never truly separated. That's called EPR correlation. What the Eeties must have done is send over the gate — the hoop you found — by some conventional means, a slower-than-light ship. The gate is EPR-correlated with another object back home, a transmitter at Tau Ceti maybe. The transmitter makes a joint measurement on itself and the unknown quantum system of the object to be teleported. That means measuring quantum properties, Malenfant, like photon spin, or ... the transmitter sends the receiver gate the classical result of the measurement. Knowing this, the receiver can convert the state of its EPR twin into an exact replica of the unknown quantum state the transmitter destroyed ...."

For seventeen months he'd been confined within a chamber a few meters across; now, his world opened out to infinity.

Resolutely he turned to face *Discovery*. The paintwork and finishing over the hull's powder-gray meteorite blanket had pretty much worn away and yellowed; but the dim sunlight made it look as if the whole craft had been dipped in gold.

Right now he didn't want to look up, down or around, and certainly not at the Eetie artifact.

His MMU, the Manned Maneuvering Unit, was stowed in a service station against *Discovery*'s outer hull, under a layer of meteorite fabric. He uncovered the MMU and backed up into it; it was like fitting himself into the back and arms of a chair. Latches clasped his EMU. He powered up the control systems, and checked the nitrogen-filled fuel tanks in the backpack. He pulled his two hand controllers round to their flight positions, and released the service station's captive latches.

He tried out the MMU. The left hand controller pushed him forward, gently; the right hand enabled him to rotate, dip, and roll. Every time a thruster fired a gentle tone sounded in his headset.

He moved in short, straight lines around *Discovery*. After forty years in a glass case at KSC, not all of the pack's reaction control thrusters were working. But there seemed to be enough for him to control his flight. And the automatic gyro stabilization was locked in.

It was just like working around Shuttle, if he focused on his immediate environment. But the light was odd. The Sun was a remote point source that cast long, sharp shadows, and he missed the huge, comforting presence of the Earth; from low Earth orbit, the daylit planet was as bright as a tropical sky.

Time to get with it, Malenfant.

Now, suddenly — and for the first time in the whole damn mission — fear flooded him. Adrenaline pumped into his system, making him feel fluttery as a bird, and his poor old heart started to pound.

Resolutely, he worked his right hand controller. He turned to face the Eetie artifact.

" ... Malenfant, I've got to tell you again that this is just speculation. I wouldn't recommend going anywhere near the artifact until you've done some more measurement. For one thing, we don't know if that gate you've found works as both receiver and transmitter. And even if it does transmit, you've got no guarantee that the signal will be picked up — twelve light-years away — by a receiver at the *Sun*'s gravitational focal point, in the Tau system ..."

The artifact was a blank circle, mysterious, framing only stars. He could see nothing that he hadn't seen through *Discovery*'s cameras, truthfully; it was just a ring of some silvery metal, its faces polished and barely visible in the wan light of the Sun.

He fired his RCS, and began to glide forward.

The gate grew, in his vision, until it was all around him. He was going to pass through it — if he kept going — somewhere near the center.

He looked back at *Discovery*. Its huge, misty main antenna was pointed back toward Earth, catching the light of the Sun like spiderweb. He could see instrument pallets held out from the hab module's yellowed, cloth-clad bulk, like rear-view mirrors. The pallets were arrays of lenses, their black gazes uniformly fixed on him.

Just one press of his controller and he could stop right here, and go back.

He reached the center of the disc.

A pink light bathed him.

He leaned forward inside his stiff HUT unit, so he could look up.

The artifact had come to life. The pink light was coming from the array of gun-like objects mounted around the circle.

"And — Malenfant, you can't clone quantum information. Do you understand? That's the constraint of the Uncertainty Principle. You can swap it around, but you can't copy it, as you can classical information. You have to destroy the object you're going to teleport. And there's no guarantee of reconstruction. Malenfant? Damn it, this light delay is going to wipe me out; I can't bear to wait twelve days before I hear from you ... Please don't do anything rash out there until we've had a chance to talk again. OK? Malenfant? ..."

He could see speckles in the light. Coherent, then. And when he looked down at his EMU, he saw how the white fabric was crisscrossed by the passage of dozens of points of pink light.

Lasers. Was he being scanned?

He said, "This changes everything."

The pink light increased in intensity, until it blinded him. There was a single instant of pain, unbearable, agonizing.

THE LIGHT FADED.

He realized he'd been holding his breath. He let it out, gasping; his chest ached.

He was grasping the hand controllers, compulsively. He flexed his hands; this old suit design wasn't as good as the modern Japanese makes with their exoskeletal multipliers, and the gloves were stiff.

He looked around. The artifact was all around him, inert once more. He couldn't see any difference; the Sun's light glimmered from its polished surface, orange and dim —

Orange?

The fabric of his EMU was stained a deep, somber orange-brown.

He looked up, to the Sun. He flipped up his gold sun-visor.

The Sun was a little dimmer. And definitely orange ... *Because it isn't the damn Sun.*

He worked his controller, and swiveled. Beyond the metal gate, *Discovery* was gone. *No. She's just parked twelve light-years away, is all.*

He looked around the sky. The stars were a rich carpet of diamonds on velvet. He tried to pick out constellations, to figure how they had changed since his translation from Sol.

Movement, just ahead of him: He rotated again.

It was one of the spider-robots. It was heading toward the gate, its limbs writhing stiffly. There was a puff of what looked like reaction control engines, little sprays of crystals that glittered in the remote light of Tau Ceti.

It seemed to spot him. It stopped dead, in another flurry of crystals, perhaps a kilometer away. Perhaps it was studying him. Those articulated limbs were still writhing, apparently working at the torso of the machine. He could barely see it, actually; the device was just an outline in Tau Ceti light.

Malenfant calculated.

He hadn't expected a reception committee. This was just a workaday teleport gateway, a portal for unmanned robot drones. He certainly couldn't expect this drone, now, to figure out his life support needs.

He reckoned he had around five hours life support left. If he went back — assuming the portal was two-way — he might even make it back to *Discovery*.

Or he could stay around.

It would be one hell of a first contact, though, when the inhabitants of the Tau system came out to see what was going on, and found nothing but his desiccated corpse.

But you've come a long way for this, Malenfant. A hell of a long way. And if you stay, they'll sure know we're here.

He grinned. *It's not a bad deal for an old bastard.*

He worked his left hand controller; with a gentle shove, the MMU thrust him forward, toward the drone.

He took his time. He had five hours to reach the drone. Or maybe the drone would come out, to meet him halfway. And he needed to keep some fuel for maneuvering at the close, if he was still conscious to do it.

Everything's going to be different now. The Eeties won't be sending drone factories anymore; they'll send ships, with crew. And there'll probably be a whole fleet, from Europe, Japan — even America, damn it — following me out here, to see what I've found.

Yeah. Everything's different, now.

By the time he reached the drone, his oxygen alarm was chiming, softly, continually, inside his helmet.

He stayed conscious long enough to reach out a gloved hand, and stroke the drone's wide metallic hide.

THE DRONE ENFOLDED THE BULKY, INERT FORM IN its manipulator arms. It swiveled in space, and headed inward, purposefully, toward the orange light of Tau Ceti.

Fusion Summer

PART 3

WHEN BRIND FIRST ASKED TO MEET ME at Kennedy Space Center, I had no idea what her call would lead to.

Neutron star rise:

It came over the horizon now, its distance from the primary star's surface only a third of that between the Earth and its Moon. The primary's photosphere rose yearningly as the neutron star passed, and great lumps of glowing material tore free and swirled inward —

— to a central point, a tiny object of such unbearable brightness that my periscope covered it with a spot of darkness. Beneath it, a column of gas rose up from the primary, attenuated, snaking, no more than a few hundred meters across at its neck. The neutron star stalked over its companion's surface disdainful of the star material which clustered around it.

Until the explosion came.

It was fusion summer.

Alone in my tiny hab module — eighteen light-years from Earth, and a helpless passenger of the Prion — I cowered.

But for me — for all of us — fusion summer changed everything.

I barely got out of N'Djamena alive.

Nigerian and Cameroon troops were pushing into the airstrip just as the Sänger's undercarriage trolley jets kicked in. I heard the distant crackle of automatic fire, saw vehicles converging on the runway. Somewhere behind me was a clatter, distant and small; it sounded as if a stray round had hit the Sänger.

The spaceplane threw itself down the runway, pressing me back into my seat, its leap forward sudden, gazelle-like. The Sänger tipped up on its trolley, and the big RB545 engines kicked in, burning liquid hydrogen.

The Sänger rose almost vertically. The gunfire rattle faded immediately. I shot into cloud and was through in a second, emerging into bright, clear sunshine.

I glanced down: the land was already lost, remote, a curving dome of dull desert-brown, punctuated with the sprawling gray of urban development. The sky faded down to a deep purple.

Fighters — probably Nigerian, or maybe Israeli — were little points of silver light in the huge sky around me, with contrails looping through the air. They couldn't get close to me, unless I was seriously unlucky.

I lit up the scramjets, and I was kicked in the back, hard. The turbulence smoothed out as I went supersonic. At thirty thousand meters, still climbing, I pushed the RB545 throttle to maximum thrust. My acceleration was a Mach a minute; on this sub-orbital hop to Senegal I'd reach Mach 15, before falling back to Earth.

I was already so high I could see stars. Soon the reaction control thrusters would kick in, and I'd be flying like a spacecraft.

The Sänger was showing no evidence of harm from the gunfire I presumed it had taken. The Sänger is a good, solid German design, built by Messerschmitt-Boelkow-Blohm. It is designed to operate in war zones.

For the first time since arriving in Chad with my cargo of light artillery shells, I had time to relax. I'm not a warrior; safe now in my high-tech cocoon, I gave way to the tension for a couple of minutes.

While I was still shaking, the Sänger logged into the Net and downloaded my mail from the comsats in geo. Life goes on.

That was when I found the message from Sally Brind.

She didn't tell me who she represented, or what she wanted. I had to meet her at KSC. Just that; I had no choice.

Over the years I've had a lot of messages like that. They're usually either from lucrative would-be employers, or some variant of cop. Either way it was wise to turn up. I would just have to figure out which Brind was.

I acknowledged the message.

I pressed a switch, and the RB545s shut down with a bang. I was thrust forward against the straps as the acceleration cut out.

Now I had gone ballistic, like a hurled stone. Coasting over the roof of my trajectory in near-silence, I lost all sensation of speed, of motion.

When I got back to the States, I flew out to Orlando.

To get to KSC I drove north along US 3, the length of Merritt Island. There used to be security gates; now there was nothing but a rusting fence, with a new smart-concrete road surface cut right through it.

I parked at the Vehicle Assembly Building. It was 7:30 a.m. The place was deserted. Sand drifted across the empty car park, gathering in miniature dunes.

I walked out to the old press stand, a wooden frame like a baseball bleacher. I sat down, looking east. The Sun was in my eyes, and already hot; blasting down from the ozone-depleted sky I could feel it draw my face tight as a drum.

To the right, stretching off to the south, there were rocket gantries. In the mist, the launch complexes looked gray, colorless,

like bits of an oil refinery. Most of them were disused, part-dismantled, museum pieces.

The sense of desolation, abandonment, was heavy in the air.

"I wonder if you know what you're looking at, here."

The voice had come from behind me.

A woman sat in the row behind me in the stand. Her bony wrists stuck out of an environment-screening biocomp bodysuit. She must have been sixty.

"You're Brind," I said.

She grinned, showing rebuilt teeth. "And you're Madeleine Meacher. Good to meet you."

I growled back at her. "What am I doing here, Brind?"

For answer, she stuck out a bony finger and pointed east, to the empty treeline beyond the Banana River. "Over there was the site of the two great launch complexes. 39-B to the left, 39-A to the right. 39-A was the old Apollo gantry. Later they adapted it for Shuttle." The sunlight blasted into her face, making it look flat, younger. "Well, the pads are gone now, pulled down for scrap. The base of 39-A is still there, if you want to see it. There's a sign the pad rats stuck there for the last launch. *Go, Discovery*! Kind of faded now, of course."

"What do you want, Brind?"

"Do you know what a burster is?"

I frowned. "No kind of weapon I've ever heard of."

"It's not a weapon, Meacher. It's a star."

I studied her again. Her biocomposite suit looked efficient, not expensive. A wage slave, not an entrepreneur. "You're from the Government? Oh," I said. "Don't tell me. Draft board."

Brind dabbed at sweat with a crumpled biocomp sleeve. "Not exactly. Look, Meacher, I have a proposal for you."

I got up.

"It would pay you to listen." Her face was like leather, her voice gravelly and full of menace. "I know a great deal about you."

"How come?"

"If you must know, through the tax bureau. You have operated your ..." She waved a hand dismissively. " ... enterprises in over a dozen countries over the years. But you've paid tax on barely ten percent of the income we can trace."

"Never broken a law."

She eyed me, as if I had said something utterly naive. "The law is a weapon of government, not a protection for the likes of you. Surely you understand that."

"What are you trying to say, Brind?"

"That it would not be difficult for us to nail you, if we needed to." Her face hardened. "When I was young, we used to call what you do gun-running. Although I don't suppose that's how you think of it yourself."

The remark caught me off guard. "No," I said. "I'm a pilot. All I ever wanted to do is fly; this is the best job I could get. In a different Universe, I'd be —"

"An astronaut."

The foolish, archaic word got to me. And here, of all places. "Brind, there are no astronauts anymore."

"That isn't true, Meacher. Come with me. Let me show you what we're planning."

BRIND TOOK ME OUT TO LAUNCH COMPLEX 41, THE OLD USAF Titan pad at the northern end of ICBM Row. Here, Brind's people had refurbished an antique Soviet-era Proton.

The booster was a slim black cylinder, fifty-three meters tall. Six flaring strap-on boosters clustered around the first stage, and I could pick out the smaller stages above. A passenger capsule and hab module would be fixed to the top, shrouded by a cone of metal.

"The capsule isn't much more sophisticated than an Apollo," Brind said. "It only has to get you to orbit and keep you alive for a couple of hours, until the Prion come to pick you up."

"Me?"

"Would you like to see your hab module? It's being prepared in the old Orbiter Processing Facility ..."

"Get to the point, Brind. What do you want? And what exactly is a burster?"

"A type of neutron star. A very interesting type."

"Really."

"The Prion are sending a ship there. They've invited us — that is, the UN — to send a representative. An observer. We think it's important to send one. We can send our own science platform; we'll train you on using it. We can even establish our own Saddle Point gateway, in the neutron star system. It's all part of a wider trade and cultural deal, which —"

"You represent the UN?"

"Not exactly."

"Let me get this straight. You want me to travel to this neutron star, on a Prion ship."

"We need somebody with the qualifications and experience to handle a journey like this. You're about the right age, at thirty-eight. You've no dependents that we can trace." She sighed. "A hundred years ago, we'd have sent John Glenn. Today, the best fit is the likes of you. You'll be well-paid."

I thought it over, trying to figure the angles. "That Proton is sixty years old, the design even older. You don't have much of a budget, do you, Brind?"

She prickled at that. "What does the budget matter? For Christ's sake, Meacher, don't you have any wonder in your soul? I'm offering you, here, the chance to travel to the stars. My God — if I had your qualifications, I'd jump at the chance."

"But it's not exactly being an astronaut," I said sourly. "Is it? Being live cargo on a Prion flower-ship doesn't count."

It had happened before. I knew of three Americans who'd flown off to the Saddle Point gateways with the Prion, never to be seen again. Not to mention the original pioneer, Reid Malenfant, who had evidently flown into the first gateway, at the Tau Ceti Saddle Point, and had never been heard of since. Probably there had been more. According to the Prion, they would be returned safe and well, and un-aged, in a few decades. "Those guys were passengers, not *pilots*."

"Actually a lot of people agree with you," she said. "That's why we've been able to assemble such little funding for the mission. It just doesn't inspire the soul, and no one's prepared to vote for it. Most people are happy just to wait for the Prion to parachute down more interstellar goodies from the sky."

"Why don't you just send along an automated instrument pallet? Why send a human at all?"

"No." She shook her head firmly. "We're deliberately designing for a human operator."

"Why?"

"Because we want a human there. A human like you. We need someone with — acumen. You'll have a lot of discretion out there, Meacher. There may be opportunities."

"What kind of opportunities?"

"To get humanity out from under the yoke of the Prion."

For the first time there was a trace of anger in her voice, passion.

"Besides," she said, "it won't do us any harm at all if the Prion think we're dumber than we really are."

I looked at her from a new angle. I knew there were various shadowy groups, working in government and for the various inter-governmental agencies, who weren't happy with the deals our various governments had been striking with the Prion.

Evidently they were now trying, quietly, to do something about it.

But even so —

"How far is it, to this burster?"

"Eighteen light-years."

"I won't do it."

"It's that or the Gulf," she said evenly.

The Gulf. *Shit.*

After twenty years of escalating warfare the Gulf was like the sur-

face of Io: glassy nuke craters, punctuated by oil wells which would burn for decades. Even with biocomp armor, my life expectancy would be down to a few months.

I turned, and lifted my face to the Florida sun. It looked like I just didn't have a choice.

But, I suspect, I was kind of *glad* about that. Something inside me began to stir at the thought of this improbable journey. Maybe, after all, as I'd always dreamed, I could be some kind of John Glenn for 2061.

And crossing the Galaxy with the Prion might be marginally safer than flying Sängers into N'Djamena, anyhow.

THE SUN'S GRAVITATIONAL FIELD ACTS AS A SPHERICAL lens, which magnifies the intensity of the light of a distant star along the line connecting the Sun to the star. At the point of focus — called a Saddle Point, out on the rim of the Solar System — the gain is measured in hundreds of millions.

The Prion use gravitational lensing to send high-fidelity teleportation signals between the Saddle Points of neighboring stars. Evidently, this is the smartest way anyone has come up with of traveling between stars. It's slow — restricted to the speed of light — but it gets you there.

But we know that the Prion didn't originate the technology. Some older species, who have been spreading out from the center of the Galaxy along the Orion-Cygnus galactic arm, are the true pioneers.

We call them the Builders. We don't know much about them. The Prion won't say much.

Every star has a different focus, in the Sun's gravitational field. The burster neutron star's was over eight hundred astronomical units from the Sun — eight hundred times the radius of Earth's orbit. Now, I was going to have to travel out there, with the Prion.

Brind prepared me some contracts. I tidied up my affairs. I was going to be gone for thirty-six years, at minimum. I said goodbye to my mother, rented out my apartment, sold my car. I insisted on having the salary up front, so I could deposit it at compound interest.

I decided to call my little capsule *Friendship-7*.

HOLD-DOWN BOLTS EXPLODED, AND I FELT THE BOOSTER JERK UNDER ME.

I could feel vibration but no acceleration; I knew that the Proton had left the ground and was in momentary stasis, balanced on its thrust.

But already, I had left the Earth.

I whooped. "Shit hot!"

I could hear an exultant reply from the KSC Firing Room, but could make out no words.

Now the rockets' roar engulfed me. Acceleration settled on my chest, mounting rapidly.

I felt the booster pitch over as it climbed. After two minutes there was a clatter of explosive bolts, a dip in the acceleration. Staging: The six Soviet-style strap-on liquid rocket boosters had been discarded.

I was already more than fifty kilometers high, already in space.

Now the main core of the Proton burned under me, and as the mass of the ship decreased the acceleration built up, to four, five, six times gravity. But I'd trained hard, and muscles that were as taut as when I was at high school absorbed the punishment easily.

Friendship-7's protective shroud cracked open. The blue light of Earth flooded the cabin. I could see fragments of ice, shaken free of the hull of the booster; they glittered around the craft like snow.

At five minutes the acceleration died, and I was hurled forward against my restraints. I heard rattles as the main booster core was discarded. Then came the crisp surge of the next stage.

I felt my speed mount, impossibly rapidly.

The second stage died. I was thrown forward again.

The orientation system switched on. *Friendship-7* swiveled in space.

I could see the skin of Earth, spread out beneath me like a glowing carpet, as bright as a tropical sky.

It had been one mother of a ride. But here I was — at last — in orbit.

To hell with the Prion, to hell with Brind, I thought. Whatever else happened from here on in, they couldn't take this memory away from me.

I traveled through a single orbit of the Earth. There were clouds piled thickly around the equator, reaching up to me. The continents on the night side were outlined by chains of city lights.

I could see the big eco-repair projects, even from here, from orbit. Reforestation projects were patches of virulent green on the continents of the northern hemisphere. The big southern continents were filled with hot brown desert, their coasts lined gray with urban encrustation. Patches of gray in the seas, bordering the land, marked the sites of disastrous attempts to pump carbon dioxide into the deep oceans. Over Antarctica, laser arrays glowed red, laboring to destroy tropospheric chlorofluorocarbons. The Gulf was just a sooty smudge, drowning in petrochemical smog. Over central Africa I looked for N'Djamena, but it was hidden by storm clouds. There was a flash of lightning, somewhere beneath thick clouds, like a light bulb exploding under cotton wool.

The whole damn planet was a bottleneck. All our conflicts and efforts were directed toward fixing up a limited, broken-down ecology, and on closed-economy problems: battles over diminishing resources in the oceans, on the fringes of the expanding deserts.

Damn it, I thought, *we need to get off-planet. The goodies the Prion sell us just aren't enough.*

Now I saw, kilometers below me, a thin spark, crawling across the sky. It turned out to be a Kawasaki Heavy Industries profac crawler, a hundred kilometers up. The profac was a Japanese scoop-ship, steadily mining volatiles — nitrogen, oxygen, and water vapor — from the Earth's upper atmosphere, for export to the Moon.

When I flew once more over the glittering east coast of North America, the Prion ship was waiting to meet me.

IN EARTH ORBIT, THE PRION FLOWER-SHIP DIDN'T LOOK SO SPECTACULAR. It was laid out something like a squid, a kilometer long and wrought in silver, with a bulky main section as the 'head' and a mess of 'tentacles' trailing behind. Dodecahedral forms, maybe six foot across, silvered and anonymous, clung to the tentacles.

Now, dodecahedra drifted away from the ropes, and clustered around my antique craft.

As far as anyone can tell, the dodecahedra are individual Prion. Maybe. Or maybe they are nodes in some kind of greater network of intelligence. But nobody has ever intercepted any kind of signal, passing between the dodecahedra. The Prion don't volunteer a lot of information.

They certainly moved in calm harmony, now, as they fixed themselves to the hull of my improvised craft.

My ship was hauled into the silvery rope stuff. Strands adhered to my hull, until my view was criss-crossed with silver threads, and I had become part of the structure of the Prion ship.

Then the flower-ship unfolded its petals. They made up an electromagnetic scoop, a thousand kilometers wide. The lower edge of the scoop brushed the fringe of Earth's atmosphere, and plasma sparkled.

After a couple of widening loops around the planet we sailed out of Earth's orbit.

Within a few hours, we were passing the Moon.

The Moon was a round, battered, complex object, obviously three-dimensional. Over its dark side I could see the lights of the swarming Japanese mine complexes. We passed over Landsberg Crater, a three-kilometer-deep pit near the lunar equator. The Japanese are using the place as a natural open-pit mine, retrieving concentrations of aluminum, titanium and other metals from the crater walls and central peak. An experimental mass driver lay against the outer crater wall, a silver thread against the regolith. The Japanese had roofed over the crater with a multilayered dome of transparent silicone; radiation shielding was provided by a layer of water within the dome, and the whole thing was prestressed against internal pressure with a cable net.

From orbit Landsberg looked like a droplet of water, tinted green,

shimmering on the Moon's bone-dry surface.

A dozen Prion craft orbited over the lunar poles, shining tangles of threads. Little Japanese shuttles climbed up to them with their cargoes of helium-3, mined from the Moon's regolith.

Earth and Moon shrank behind us, a glowing double planet.

For the long haul out to the burster's Saddle Point solar focus, we would be traveling at an acceleration equivalent to the Moon's gravity. The Prion actually do a lot more business with the lunar Japanese than with us; they seem to have settled on one-sixth G as the standard for their human passengers.

Eating interplanetary hydrogen, we sailed toward the Sun. The flower-ships routinely dive in to the heart of the Solar System, to exploit the rich solar wind there. If you know how to look, from Earth you can see the flower-ships sailing round the Sun, even in daylight.

It would take us one hundred and ninety-eight days to travel out to the burster's Saddle Point, eight hundred AU from the Sun.

Soon only the Sun showed a disk, and even that was diminishing. The walls seemed to close in around me; I was in a little prison, suspended in infinite space.

I suffered space adaptation syndrome for four days.

My hab module was an old Shuttle Spacelab frame — sixty years old and flown in orbit twice — dug out of storage at KSC, gutted and refurbished. At the front was my small pressurized hab compartment, and there were two open instrument pallets at the rear, fitted with pointing systems and deployable booms. There were a whole bunch of instruments which would be directed at the neutron star: coronagraphs, spectroheliographs, spectrographic telescopes.

The interior of my hab module was maybe six meters long, four wide. It was a little octagonal cave, the walls encrusted with equipment and storage bays. The false ceiling above me was broken by a couple of high-quality viewing ports and by small science-experiment airlocks, tiny, sturdy hatches like the doors of little safes. Simple periscopes were fitted to the viewports. There was a work bench, with an overhead light, a couple of seats with straps, and clamps and racks and storage compartments. The one-sixth G was easier to work in than zero-G, most of the time, and easier on the body. But the Spacelab had been built for zero-G. Half the switches were on the floor, or the ceiling, and I kept banging my damn head.

The whole thing was clunky and old, with hard-wired qwerty keypads, for God's sake. I was used to the cockpits of scramjets, of designs funded by the bottomless wells of military expenditure: clean glass boxes, everything solid-state and configurable.

Brind gave me a powerful processor to enable me to communicate, to some extent, with my Prion hosts. It was a bioprocessor, a little cubical unit. It was based on ampiphiles, long molecules with watery heads and greasy tails, that swam about in layers called Langmuir-Blodgett films. The active molecules used weak interactions — hydrogen bonding, van der Waals forces and hydrophobic recognition — to assemble themselves into a three-dimensional structure, of supramolecular arrays thousands of molecules long.

The biopro was high technology, one powerful mother, and it was the one place Brind's people had spent some serious money. I spent a long time going over its specs.

I wasn't so happy to find, though, when I first booted up the biopro, that its human interface design metaphor was a two-dimensional Virtual representation of Brind's leathery face.

"Brind, you egotistical bastard."

The image flickered a little, and her skin was blocky — obviously digitally generated — and when she spoke, her voice was tinny and just a little out of sync of her lips. "Just want to make you feel at home."

It — she — turned out to be backed up by a complex program, interactive and heuristic. She could respond to what I said to her, learn, and grow.

She would be company, of a sort.

"Are you in contact with the Prion?"

She hesitated. "Yes. In a way."

After Reid Malenfant's first contact with the Prion, twenty years earlier, it had taken a decade of hard work, on both sides, to come up with a basic shared vocabulary. The world-view of the Prion is not the same as ours. They don't even share the basic concept of 'language' with us.

"Anyhow I'll keep you informed," Brind said. "In the meantime, the best thing you can do is follow your study program." She started downloading some kind of checklist; it chattered out of an antique teletype.

"You have got to be kidding," I said.

"You've a lot of training on the equipment still to complete," Virtual-Brind said. "And you'll get little time to deploy it effectively, when we get to the burster."

"Terrific. And should I study neutron stars, bursters, whatever the hell they are?"

"I'd rather not. I want your raw reactions, Meacher. If I coach you too much it will narrow your perception. Remember, you'll be observing on behalf of all mankind. We may never get another chance. Now. Maybe we can start with the spectroheliograph deployment procedure ..."

RAMJETS WORK BY SCOOPING IN HYDROGEN ATOMS from interplanetary space. The hydrogen atoms fuel onboard fusion reactors; the helium ash from the fusion process is used as reaction mass. The advantage of a ramjet is that it has an inexhaustible supply of fuel.

Interplanetary ramjets are far, far beyond human technology. We don't know how to build a stable electromagnetic scoop of that size, nor how to shield a human crew from the resulting radiation.

Our most advanced propulsion systems are the helium-3-deuterium fusion drives the Japanese are testing on the Moon. But they can only fly as far or as fast as their fuel stores will take them. Under our own power we'd barely been able to send one man, Reid Malenfant, out to the Saddle Point radius. It was going to be that way until someone figured out how to establish fuelling stops in the outer Solar System.

By comparison, the Prion were able to sail around the outer System, and in toward the Sun, virtually at will.

Because the Prion had a ramjet technology already, nobody was putting any money into a human variant. It's as if we had ceded the whole of the outer Solar System to the Prion. We had to negotiate to buy raw materials and science samples from out there.

It bugged me like crazy. It's *our* Solar System, damn it.

"Brind, tell me something. Why 'Prion'?"

"That was kind of a sick joke. It came up among some of the UN diplomats who were sent to work with the Prion when they first came to the inner System in force, after the Malenfant incident. A sick joke that stuck."

Malenfant's motive had been to alert the Prion to our presence, there at the heart of the System. Before Malenfant the Prion had just teleported over robot tractor craft, which had begun mining the asteroids for raw materials, presumably as a prelude to eventual large-scale Prion colonization.

Presumably the Prion had thought the System was uninhabited, before Malenfant. And presumably, once they found out we were here, their industrial activities in the belt stopped, their colonization project aborted.

Presumably. That kind of information is classified. Maybe it's something we're going to have to deal with in the future.

"'Prion' is a term from biology," Brind said now. "A prion is an infectious agent that doesn't need DNA. It's just a bunch of protein molecules. Scrapie in sheep, and the Creutzfeldt-Jakob Disease in humans, are examples. A prion doesn't reproduce conventionally. Instead it corrupts its neighbors. Biological information is encoded by the shape of a protein; the prion causes other proteins to fold over into its own form in a kind of chain reaction."

I wondered what hidden knowledge about the Prion's interstellar

colonization strategy had been encoded in that grisly diplomats' joke.

"Brind. What do the Prion call themselves?"

"The Human Beings," she said.

I HAD A LOT OF TROUBLE SLEEPING.

I had a bag which I slung across the interior of the hab in a hammock. I would turn, inside the sleeping bag, and feel myself bounce over the taut hammock. My heart, evolved to fight Earth's gravity, was too strong; blood seemed to boom through my hearing. I could hear the hum and whir of the lab's equipment, as well as the occasional hiss of the Prion's rope-like restraints as they slid over the hull of my hab. Every time some pump or fan turned itself on or off I'd jerk out of whatever light doze I'd achieved.

I'm a good pilot, a lousy passenger. That little Spacelab module turned into a cage for me, long before we reached the Saddle Point.

I brooded, and exercised compulsively. I was angry a lot of the time — at Brind, at the fate which had landed me in an era when humans had so little control over their destiny, at not being able to fly, at the Prion.

One hundred and ninety-eight days wore away, unbearably slowly. We climbed out to the rim of the System, to where the Sun is reduced to a golden yellow point source.

ON THE DAY WE ARRIVED AT THE SADDLE POINT, BRIND DISTURBED ME from my breakfast.

"Meacher. Come over here."

I loped over to an observation port periscope.

Through the tangle of Prion rope-hull, I could see that the pale pink glow of the flower-ship's electromagnetic scoop was fading.

"Hey," I said. "They've shut down."

The acceleration faded, and I felt myself float easily into the air. I began chasing down loose pieces of equipment.

"We're still moving at many kilometers a second," Brind said. "We're close to the gateway. Meacher, I think you should prepare yourself."

I took my breakfast — crackers and meat paste — and strapped myself into a seat by the data processing console.

I'd seen Virtuals of the Prion's gateways. They are just hoops a hundred meters across. The Prion hauled the first of them from their base at Tau Ceti the slow way, using a big interstellar ramjet, and then sent the rest through by teleport, in pieces. They pushed them into place around the lip of the Solar System with their ramjet flower-ships.

As far as I could tell, we weren't decelerating.

"I guess they'll slow before we rendezvous, right?"

"Meacher, the Prion aren't human pilots. They don't believe in slowing down. We're just going to go flying through that damn gateway. Hold onto your breakfast, Meacher. And make sure your instruments are working when we go through the gate."

"Yeah." I began to power up the pallets.

Brind seemed to turn, in her CRT monitor fish-tank. "I think —"

There was a pink glow, across the work surfaces and consoles of my hab. I looked up. The glow brightened, suddenly, dazzling me, washing out Brind's image.

There was a single instant of searing, deadly pain.

YOU CAN'T CLONE QUANTUM INFORMATION. THE UNCERtainty Principle dictates that. You can swap information around, but you can't copy it, as you can classical information.

So the Prion gateways must destroy the objects they teleport, using coherent light.

For eighteen years I did not exist. I was essentially dead (though not legally).

For eighteen years a signal crossed space, to a receiver gateway which had been placed, by a ramjet, in the system of the burster neutron star. There was no guarantee that the signal would be received at all, let alone with good fidelity.

No one knows if the thing, the duplicate, that was finally constructed of star-stuff by the receiver gateway, eighteen light-years distant, was in any sense me.

Thus, I crossed interstellar space.

THERE WAS NO SENSE OF WAKING. I WAS JUST THERE, WITH THE SPACElab's systems whirring and clicking around me as usual, like a busy little kitchen.

The light was different, though.

I made for my periscope.

From the dimly lit, barren fringe of the Solar System, I had been projected into a crowded space.

I was sailing over the surface of a star. Polarizing filters in the viewport periscope dimmed its light to an orange glow. The photosphere, barely ten thousand kilometers below, was a flat-infinite landscape, encrusted by granules each large enough to swallow the Earth, and with the chromosphere — the thousand-kilometer-thick outer atmosphere — a thin haze above it all. The granules, individual convective cells, were coherent polygonal structures, grouped into loose associations. As I watched, one granule exploded, its material bursting across the star's surface; neighboring granules were pushed aside, so that a glowing, unstructured scar was left on the photosphere, a scar which was slowly healed by the eruption of new granules.

I could have spent my life watching this.

An instrument pod of some kind uncoiled from the tangled hull of the flower-ship on a graceful pseudopod. The instruments peered into the umbra of a star-spot below us. The ship surged as the flower scoop thumped into pockets of richly ionized gas.

"This is an F-type white dwarf star, Meacher," Brind said. "A close cousin of the Sun. The dominant partner of the binary pair in this system. We're along the same vector from Sol as Epsilon Eradini, but around twice as far away."

"My God, Brind. Why didn't you warn me? Why didn't you tell me it would be like this?"

"How could we know, Meacher? The Prion don't exactly keep us briefed."

"I don't understand how come the Saddle Point for this system wasn't out on some remote rim, like in the Solar System. I expected to spend another couple of months sailing in."

"Meacher, the gravitational map of this binary system is complex, a lot more than Sol's. There is a solar focus point close to each of the system's points of gravitational equilibrium. We emerged from L4, the stable Lagrange point which precedes the neutron star in its orbit, and that's where we'll return."

"There must be other foci, on the rim of the system. Other Saddle Points which would be a hell of a lot safer to use."

"Sure." She grinned. "But the Prion aren't human, remember. They seem to have utter confidence in their technology, their shielding, the reliability and control of their ramjets. More than we can aspire to. Meacher, we have to assume that the Prion know what they're doing ... Look, we can analyze this for the rest of our lives. Your life, anyhow. The thing to do now is observe, as the Prion are doing."

"Right." I turned to the consoles. Soon, my monitors showed that data was starting to come in on hydrogen alpha emission, ultraviolet line spectra, ultraviolet and x-ray imaging, spectography of the active regions, zodiacal light, spectroheliographs. Training and practice took over as I went into the routine tasks, and as I worked, some of my awe went away.

"Meacher. Look ahead."

I reached for my periscope again. I looked at the approaching horizon —

— over which dawn was breaking. Dawn, on a star?

"My God, Brind."

"Just watch," she said softly. "Watch and learn. And remember, for all of us."

A great pulse of torn gas fled toward us over the horizon and subsided in great arcs to the star's surface, the battered atoms flailing in the star's magnetic field — and again, a few seconds later — and once again, at deadly regular intervals. And the breaths of plasma

grew more violent.

"What's happening?"

"Neutron star rise," Brind said gently. "Watch the instruments, Meacher."

It came over the horizon now, its distance from the primary star's surface only a third that between the Earth and its Moon. The primary's surface rose yearningly as the neutron star passed, and great lumps of glowing material tore free and swirled inward — to a central point, a tiny object of such unbearable brightness that the periscope covered it with a spot of darkness. Beneath it, a column of gas rose up from the primary, attenuated, snaking, no more than a few hundred meters across at its neck. The neutron star stalked over its companion's surface, disdainful of the star material which clustered around it.

Until the explosion came.

"What the hell —"

My smart periscope had blanked over. The darkness cleared slowly, revealing a cloud of scattered debris through which the neutron star sailed serenely.

"That's the burster," said Brind drily.

The cloak of matter around the neutron star was building up again.

Flash.

The periscope blacked out once more.

"You'll get used to it," Brind said. "It comes every fourteen seconds, regular as your heartbeat. An X-ray flash bright enough to be seen from Earth."

I studied my instruments. The data was flowing in, raw, uninterpreted. "Brind, I'm no double-dome. Tell me what's happening. The primary's star-stuff —"

Flash.

"— fuses when it hits the neutron star, right?"

"Yes. Hydrogen from the primary fuses to helium as it trickles to the neutron star's surface. In seconds, the helium collects over the crust into a kind of atmosphere, meters thick. But it is a transient atmosphere which abruptly fuses further, into carbon and oxygen and other complex molecules."

Flash.

" — blasting away residual hydrogen as it does so."

The neutron star roared toward us, dragging its great hump of star-stuff beneath it, and —

Flash.

— bellowing out its fusion yells. The Prion pulled the flower-ship's petals in further; the mouth of our ram closed to a tight circle ahead of us.

A circle which dipped toward the neutron star.

"My God, Brind. What are they doing?"

"Try not to be afraid, Meacher," she said.

We swooped closer to the primary; red vacuoles fled beneath us like crowding fish.

"Jesus Christ!"

And we sailed beneath the neutron star, skirting the mouth of fire it tore open in the flesh of the primary.

My body decided it was time for a fresh bout of space adaptation system.

THE WASTE MANAGEMENT STATION WAS ANOTHER SHUTTLE-ERA VETeran, and it took some operating.

When I came out, I felt washed-out and drained. I opened my medical kit and took a scopalomine/Dexidrene.

"Meacher, you're earning us a first-hand view of a neutron star. I'm proud of you."

"Brind, I've been flying for twenty years, fifteen professionally. I've flown to the edge of space, pulling a Mach a minute. I have never had a ride like this."

"Yeah. Listen, Meacher. You'll have to prepare yourself for the next encounter with the burster. The neutron star's orbit around its parent is only eleven minutes." Her image seemed to be breaking up.

"Brind, I think I'm losing you."

"No. I'm just diverting a lot of processing resources right now. Meacher, I have something odd, from that neutron star flyby. I need some input from you."

"What kind of input?"

"Interpretation. Look at this." She brought up an image of the neutron star, at X-ray wavelengths. She picked out a section of the surface, and expanded it. Bands of pixels swept over the image, enhancing and augmenting.

"Do you know anything about neutron stars, Meacher? A neutron star is the by-product of a supernova, the violent, final collapse of a massive star at the end of its life. This specimen is as heavy as the Sun but only around twenty kilometers wide. The matter in the interior is degenerate, the electron shells of its atoms collapsed by the pressure. The surface gravity is billions of G, although normal matter — bound by atomic bonds — can exist there. The surface is actually rigid, a metallic crust."

I looked more closely at the image. "Looks like there are patterns on the surface of the burster." There were hexagons, faintly visible.

"Yeah," Brind said. "Now look at this."

She flicked to other wavelengths. The things showed up at optical frequencies, even: patterns of tidy hexagons each a meter or so across.

In a series of shots shown in chronological order, I could see how the patterns were actually spreading, their six-fold symmetry growing like a virus over the crystalline surface of the neutron star.

"They look alive," I said.

"Yes," Brind said. "Yes, they do, don't they?"

"This is turning into one hell of a day, Brind."

WE SPENT A DAY IN ORBIT, DUCKING AROUND THE NEUTRON STAR EVERY eleven minutes.

I made myself a meal. Life goes on, right? My cuisine was zero-G; cooking involved taking an anonymous brown bag, containing, in this case, vegetable stew. I had to push the pack inside a little sliding drawer, to inject the bag with ninety grams of hot water, and then pull it out and mush it up a little. I spiced it up with a can of nuts and a sachet of tropical punch, all fixed to a tray with Velcro.

It wasn't so bad. It was enough to give me three thousand calories a day.

Meanwhile, Brind analyzed our data on the neutron star life forms.

She called up a sequences of images on split screens. Hexagons split and multiplied into patterns of bewildering complexity, ever-changing.

"Their metabolism is based on atomic bonds," she said. "But — so that their bonds aren't broken, and their structures aren't subject to unacceptable bending moments in that huge gravity — their height off the surface can be no more than a few nanometers. Their growth paths follow the flux lines of the neutron star's magnetic field, which is enormously powerful. Evidently the complex heavy atoms deposited by the fusion processes assist and stimulate their development. But eventually —"

"I think I can guess." The images grew more blurred as the star's rudimentary, and transient, atmosphere built up.

"Think of it, Meacher," Brind said. Her image was grainy, swarms of blocky pixels crossing her face like insects; nearly all the bio-pro's immense processing power was devoted to interpreting the neutron star data. "The very air they move through betrays them; it grows too thick and explodes — wiping the creatures clean from the surface of their world."

"Well, not quite," I said. "They survive somehow, for the next cycle."

"Yes. I guess the equivalent of spores must be deposited on or below the surface of the star. They must be pretty rudimentary creatures down there right now. Robust enough to survive these global conflagrations, every fourteen seconds — probably no more advanced than lichen. I wonder how much these frenetic little creatures might achieve if the fusion cycle was removed from their world."

"How much indeed," I murmured. I watched the surges of doomed life, the hypnotic rhythm of disaster on a world like a trap.

Just like Earth, I reflected sourly.

I said, "Star lichen, huh. Maybe, without the fusion cycle, they could even rise to achieve some kind of intelligence one day, you think? And —" A thought struck me. "And how much could they be worth to the Prion?"

Brind spared enough mips to look puzzled. "What do you mean?"

"Look, we've got a completely new life-form type here. The scientific and commercial potential must be enormous; a whole new kind of chemistry must be proceeding down there. And suppose intelligence was, eventually, to arise. The lichen's descendants would be unlikely to develop space flight, given that they live at the bottom of a gravity well a billion G deep. It would be a race that would be utterly dependent on the first space-faring species to find them. Namely, the Prion. And how much profit would there be in that?"

I was, I found to my surprise, starting to get an idea.

"Meacher —"

"Shut up, Brind."

"What?"

"I need to think."

Maybe I wasn't going to turn out to be just a passive observer on this mission after all. But I doubt if John Glenn would have approved of the scheme I was planning.

THE PRION TOLD BRIND, BY WHATEVER INDIRECT channels they were operating, that we had two more days in orbit.

I called up Brind. "We have a decision to make," I said.

"A decision?"

"On the siting of our UN-controlled teleport gateway."

"Yes," she said. "Obviously the recommendation is to place the gateway at L5, the trailing Lagrange stable point —"

"No. Listen, Brind. This system must have a Saddle Point on the line between the neutron star and its parent — somewhere in the middle of that column of hydrogen attracted from the primary."

"Of course." She looked at me suspiciously. "There's a gravitational equilibrium there, the L1 Lagrange point."

"That's where I want the UN gateway, Brind."

She looked thoughtful — no, rather her face emptied of expression, and I imagined mips being diverted to the data channel connecting her to the Prion. "But L1 is unstable, Meacher. It would be difficult to maintain the gateway's position. Anyway, there would be a net flow of hot hydrogen through the gateway, into the transmitter at the Solar System end. We won't be able to use the gateway for two-way travel."

"Brind, for Christ's sake, that's hardly important. We can't get out to the Solar System Saddle Points anyhow. Listen — trust me. You said you wanted someone with acumen, someone who might see an edge. *I think I've found it.*"

She studied me. "OK." She went blank again. "The Prion want more justification."

"All right. Look, we'll be disrupting the flow of hydrogen from the primary to its neutron-star companion. What will be the effect on the neutron star?"

Brind said slowly, "Without the steady drizzle of fusing hydrogen onto the surface, the helium layer will cease its cycle of growth and explosion. The burster will die."

"But the lichen lifeforms will live. Won't they? No more fusion blow-outs every fourteen seconds."

She thought it over. "You may be right, Meacher. My God. What an achievement. It will be as if we'll have fathered a whole new race. But what's the benefit to the Prion?"

I said briskly, "Sole rights of access to the new world. We'll make no claim."

"That is valuable," she said carefully. "But why would you want to do this?"

I smiled. "The Prion don't need to know that."

I waited while she worked her data stream to the Prion.

"They agree, Meacher. I hope to hell you know what you're doing," she said.

"Me too, Brind. Me too."

The Prion opened up our flower-ship's petals and we swooped around the thin column of star-stuff.

AS SOON AS THE UN GATEWAY WAS ESTABLISHED AND OPERATIONAL, the result was extraordinary.

The gateway was set at the thinnest point of the column of hot hydrogen torn from the primary. The gateway flared lurid pink, continually teleporting. At least fifty percent of the primary's hydrogen — according to Brind — was disappearing into the maw of the teleport gate. It looked as if the column of material had been neatly pruned by some cosmic gardener, capped with an almost flat surface.

"Good," I said. "It's worked. Now we're flooding a patch of the Saddle Point radius, back in the Solar System, with dense hydrogen."

"Yeah. I take it that was your intention. Of course there's a kind of paradox."

"How so?"

She said, "There's nothing magic about teleport technology. It certainly doesn't break any energy conservation laws. An object at the transmitter end is broken down; its mass-energy is used to power the teleport mechanism and the transmitter array, or discarded as waste. And the receiver end gathers in local hydrogen, using modified Prion ramjet technology, to use as raw material for reconstructing its copy."

"I know."

"So effectively you've got the receiver, in the Solar System, gathering in thin, raw hydrogen — in order to reconstruct a teleported stream of hydrogen."

"But in a compact form." I smiled. "That's exactly it. I think it's kind of a neat solution. Don't you get it, Brind? I've ensured that a steady supply of dense, hot hydrogen is pumped into the System at the Saddle Point radius. Now, imagine a ship, a human ship, limping out there on a Japanese fusion rocket ..."

"Ah. It could refuel there. Clever, Meacher ... We're moving again."

I returned to my periscopes.

We approached the neutron star. Its ruddy surface sparkled softly as residual material fell into its gravity well.

The elaborate hexagonal patterns flowed vigorously across the surface of the star — but the lichen seemed, oddly, to pause after a dozen seconds or so, as if expectant of the destruction to come.

But the fusion fire did not erupt, and the creatures surged, as if with relief, to new parts of their world. A fourteen-second cycle to their growth remained, but that was soon submerged in the exuberant complexity of their existence. Flowing along magnetic flux lines, the lichen quickly transformed their star-world; major sections of its surface changed color and texture. It was stunning to watch.

The data I would take back on this would keep the scientists busy for decades. I felt a surge of excitement. *Maybe this is how the double-domes feel, at some moment of discovery.*

Or, maybe, an intervening god.

Then, suddenly, the growth failed.

It started first at the extremes of growth; the lichen colonies began shrivelling back to their heart lands. And then the color of the patterns, in a variety of wavelengths, began to fade, and the neat hexagonal structure became chaotic.

The meaning was obvious. Death was spreading over the star.

"My God, Brind. What's happening?"

"I expected this," the interface metaphor said.

"You did?"

"Some of my projections predicted it with varying probability. Meacher, the lichen can't survive without their fusion cycle. Our intervention from orbit was a little crude. Kind of anthropocentric. Maybe the needs of the little creatures down there are not as simple as we imagined. What if the fusion cycle is *necessary* to their growth and existence, in some way we don't understand?"

Maybe she was right. After all, the fusion cycle had delivered

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Virtual Kaballah

Aboard the generation starship *Peregrine 6*,
the game of hide-and-seek is played for the highest stakes of all.

MY MORNING BEGINS WITH AN ALFRESCO BREAKFAST BY A TWO-ROOM TRAIN DEPOT HIGH ALONG A COLORADO mountain pass. It's a windy summer day. I have plenty of time for coffee, plenty of time to work in my notebook. Three men stand at distances; fellow students of the Kaballah and heavy in their sweaters and woolen caps. To them, this place is chilly. We're men in our middle years, students of a master I need not name, and they scowl at me when they care to.

My efforts may be blasphemous, but then I've never shrunk from blasphemy. I've been struck by the formulaic nature of the Kaballistic system. The scheme is a cat's cradle of empty proto-equations brought forward from medieval Spain, originating long centuries before the rise of postmodern physics. All these divine emanations are spaces, waiting to be filled with scientifically discovered quantities. They're old wineskins for new wine. And afterward? Perhaps I'll conjure up the number of God.

Or perhaps my trial-and-error scribbling is evidence of boredom. I post the fraction 1/137 to the top right box and work zigzags, down, right, and left again. The daily steam train comes chuffing north from Chamas, carrying a load of tourists through a landscape of high beauty. Hissing and stinking of coal, the train stops to take on water. The wind blows smoke in my direction.

Breakfast is over. I need a mission. I need success. I rise and move inside the depot. It's an easy *similar functions* transit to the main station in Alexandria, hot with flyblown mugginess. Cab drivers circulate through the crowds, shouting their fares. The place reeks of stale tobacco and human anxiety. I find a stairwell. Ignoring a prohibition, I climb to the upper level and make a second easy transit to the women's quarters of a wealthy house. All the windows are shuttered by intri-

BY PHILLIP C. JENNINGS
Illustration by David Beck

cately filigreed wooden jalousies. No glass impedes the listless flow of air, heavy with the Mediterranean odors of suburban Alexandria. This room has been lived in. It exudes its own pleasant mix of sandalwood, rosewater, and baked coconut. The sun shines through in a thousand needles of light, knitting hot patterns on the wide rug.

The patterns dim, leaving an after-image until my eyes adjust. Every phenomenon has two explanations. The wrong answer is that the sun has gone behind a cloud, although with the slightest effort I could make that true. Instead, I open a screen. It creaks stiffly on its hinges.

The constellations look nearly the same as they do from Earth. We're only 352 years on a voyage that has 2,200 years to go. I superimpose a map. Every star is a sliver out of place. Six are shifted by a whole degree. Even so, the untrained eye would never have noticed.

Closer at hand, I see balconies in abundance. Madya's outer space house resembles a Babylonian ziggurat, or maybe an American wedding cake, with square levels instead of round, ascending in tiers to the final cupola tower. Everything is decorated to excess. The real *Peregrine 6* looks nothing like it.

A lifetime of gluttony has rendered her immobile, helpless, and vast. The servants bring fans to cool her, and they pat her head and shoulders with damp towels.

One thought of Madya is enough. I turn around to find her body on a steaming bed of rice, filling a large brass platter laid out on the rug. A century ago, at the beginning of our time of intimacy, she stole this image of an acquaintance from my childhood: a red-haired, green-eyed Christian girl, pale and obese. She's played with it, so she's even whiter and fatter than I knew her. Her face is almost too exquisitely pretty. Her beauty pushes the edge from ripeness to kitsch.

I shrug. Certainly, I'm not enticed by the way she smells, a cross between blubbery lamb and forbidden pork. I wonder what the true Madya looks like. Has she kept her actual image on disk? From her life on Earth, before we went virtual?

So many of us are mysteries to each other! So many of us hide behind mirrors! Three centuries ago it was different. Speeding out of the solar system, we shared the same virtual space and the same master plan, each contributing a fraction of our cerebral resources to the common pool. Enough for a house, and a bit of street. A car. A horse. A stretch of fractal landscape. We were full of the virtues of integration and interaction. How could human souls — even our own *dead, stored* human souls — stay sane over thousands of years of interstellar travel, unless we were shored up by the elaborate conventions of a supportive society?

Society! Common property! Master plans! These are almost forgotten concepts. True contact between minds is hard, and we've conjured every possible substitute. I've grown so solitary among the unreal crowds of the *Peregrine 6* that my voice grates as I try to use it. It sounds strange to my ear, dry and whispery. "Wake up, Madya. For pity's sake, wake up. Don't make me play your games."

She stays dead. If I want her badly enough, I'll have to hunt her. I'll go through trials and commit errors. Hedging our souls around with private mazes and games is a way of testing each other. *Do you really care?*

Five years ago I gave up my own environments. I thought I was transcending an obsession. After lifetimes of indulgence I reached a further stage in my spiritual evolution. There aren't many of us, not many students of the Kaballah, and we can't very well proselytize. The souls we preach to aren't easy to find.

By contrast, we make ourselves easy and open and move around in the mental worlds created by others, looking for points of contact. But is there any purpose in trying to rescue the insane? Madya knows of me, and offers grotesque versions of herself. I've learned from yesterday's efforts that kissing her overripe lips isn't the key. Nor is eating her flesh, in the manner of the cannibal sects that made so much noise back on the home planet, in the decades before our radios fell silent.

Very well then. It's important, and I *do* care. I care enough for another go. With a grimace I *become* her and lumber up onto my feet and brush yellow coconut-rice off my abundant backside.

What now? Clothes, of course. Somewhere on this upper floor, among these rooms, there must be chests of women's clothing. I walk, puffing from the effort, and my belly goes blubbetty-blubbetty.

This room opens to a stairway-hall, like six other rooms, and one of them has movie posters of handsome boys. I take this as a clue. Happily, the clothes here seem to suit; modern underwear, voluminous pants of a Turkish cut, a sheer blouse, and an outer vest decorated with hand embroidery.

Outside my window the sun begins to shine again. "Are you hungry or aren't you?" A servant pokes her head in to summon me to lunch. "You've got to eat, you know."

Apparently I'm on the right track. I'm following Madya's script. All of a sudden this upper level is busy with preparations. I stand and follow the woman who summoned me. "Your mother is waiting," she tells me over her shoulder, "and she doesn't like to wait."

I waddle back to the original room, and find the meal laid out in elaborate courses. My mother is sprawled hugely on a mattress on her side of the feast. She speaks through mouthfuls: "Come! Eat!" A lifetime of gluttony has rendered her immobile, helpless, and vast. The servants bring fans to cool her, and they pat her head and shoulders with damp towels.

Is this woman Madya? Have I found her? It seems likely she's just a feature of the script. I should revolt against this monument to carnality, but perhaps later. First I should think about it. First I should indulge this belly that betrays me, because I *am* hungry. Fiercely hungry; enough to match my mother mouthful by mouthful, while the servants carry in the radio and switch it on so we have music while we eat.

"Your father has spoken to Kassim," this mother of mine tells me, after a time. "You're old enough to get married. Kassim's family is important."

I don't know how to react. Perhaps no girl my age would. Have I seen Kassim before? Do I know what he looks like? I'm playing a role without a script, and my best course seems to be — to have another scoop of this wonderful halvah.

Mother rolls back from the feast, and the servants prop pillows under her until she's comfortable. "You have a good appetite, child," she tells me approvingly. It must be true. The waistband of my Turkish pants is cuttingly tight around my stomach, and yet I pluck at a few last delicacies.

"What does Kassim think about me?" I manage to ask.

"He wants you for an old-fashioned wife." Meaning seclusion. Certainly no car, and no career. I could grow as fat as this "mother" of mine in a very few years. It's the deadest of dead ends.

I keep noncommittal. After a few minutes, I gesture peremptorily. Servants help me to my feet, and I make my way to my room for an afternoon nap. This seems to be a good cut-point. I conjure my former body and make two transits, ending back in Colorado.

The master is sitting in the sunshine in his usual black suit and string tie, wearing sunglasses against the harsh light that is glinting from the ribbon of tracks off right and left. I describe the situation to him. "The Madya you *want* to find is the one who would approve if you fled this confining marriage with Kassim," he tells me. "Take that course first. It may be the wrong one — much time wasted on false choices, eh? I wish you were not so impatient."

I express my exasperation. "We are forty-thousand souls on the *Peregrine 6*. All but a dozen spinning further into fantasy and concealment with each passing hour. All but a dozen growing ever more private. Yet it takes *weeks* to track one person through the maze of virtuality!"

"When we find Madya, we might make her an ally," the master says. "She'd be another hunter-of-souls."

"We might never find her. From the very first she gives signs of being — perverse."

The master flaunts his hand in the limp-wristed gesture associated with homosexuals on old television shows. "I am perverse myself, by some standards."

"I'm sorry. I didn't mean — "

"Please. Don't apologize. Tonight we'll discuss the new cases. All our new missions. You've made progress. Didn't you say you loved this woman once?"

"I thought so," I tell him. "We kept company during the bad times. That was when Earth fell silent. The messages kept getting weirder, and then they stopped transmitting altogether. The shock divided us. Two people and their virtual tangos seem pretty small, compared to a planet's tragedy."

The master shakes his head. "We don't even know it's a tragedy. Radio may have been supplanted by something more progressive. Tachyrons, maybe. It's not given to us to understand our homeworld. Difficult enough to understand *ourselves*, eh?"

I smile. I think I know myself: Youssef the uncircumcised Druze, with no interest in my own religion, or in anyone else's. A man loved by women who sometimes catches the disease of love — but is it true? Have I ever *really* loved another person?

Back on Earth when I was alive, I had children. It's certain I loved them. Back on Earth when I was alive, I wondered what I was going to do in my old age. Find a second wife? Take residence in the house I'd inherited from my parents and live as a rustic bachelor in an obscure corner of Syria? Or should I follow my sons and daughters around the world and watch them practice their careers, and falter in their marriages?

Instead, I died suddenly before my year of retirement, and because I was still on the job in modern Damascus, I got whisked to a modern hospital. I was engrammed to disk. The stuff of my brain was copied by arcane protocols so I could be revived cybernetically.

Dead souls have many uses. The *Peregrine* program was a Middle Eastern version of the EC's *Biofere* series, and America's *Adastra* project. Because our ambitions came late and slowly, all the near stars and best planets were optioned already. The Japanese *Nara II* was more than halfway to Alpha Centauri B. I could have mocked the Arab League's copycat aspirations, often expressed as a credit to Islam. I could have stayed on Earth, but I chose not to. I thought a long pilgrimage might suit me.

So here I am. The new world we might someday reach and colonize with earthly life — our new world is an awfully long distance away in space and time. I hardly think about it anymore. None of us do. That's the problem. Without a common purpose, all we do is play games in virtuality.

I have time before tonight's meeting. Bidding goodbye to the master, I return to the house in Alexandria, and to the body of a fat, overfed girl. This is naptime. Out in the hall, a servant is whispering. *"Very well then, you may owe me the money until your brother sends it from America. But you must make a note and sign it, and the interest rate is 5 percent per month."*

"Hello?" I call out. "Who's that?"

"Are you awake? Do you want something, miss?" One of the servant women pokes her head into my darkened room.

"I'm bored. I'd like to take a walk. Perhaps you'd keep me company. Perhaps you'd find me suitable clothes." I waved my hand at my chests. "And I don't mean those black tents the Shi'a women wear."

"A walk?" The servant looks at me in astonishment.

"A little exercise," I explain. "Why not?"

"What about your knees? I don't think you should walk any distances. Remember last time, and the week you had to spend in bed." She pauses a moment. "I could talk to Kumar," she offers by way of substitution. "He could fetch the car after teatime. You might enjoy a little drive."

What can I say? This is apparently as much adventure as I can handle. "Yes."

The whisperers stop, or move away. Afterward, until teatime, I enjoy a dreamless sleep.

Tea is another excuse for gluttony with my mother. Together we careen among a choice of sticky desserts. "I understand you're going out," mother tells me. "Kumar is going to take you for a drive."

"If it's permitted," I answer.

She studies me. "Well, why not? You're at an age, after all." Having said this, she eats a honeyed smeed-cake.

I died suddenly and got whisked to a modern hospital. The stuff of my brain was copied by arcane protocols so I could be revived cybernetically.

After the meal, servants bring me a wrap and watch as I carefully descend the stairs, lest my feet trip in the unfamiliar tassels. Kumar has brought the limousine to the side of the house, and opens the door for me: this dark man from Pakistan, who doubtless belongs to a heretic sect.

How do I know this? I understand my part of the world. There aren't many Christian families in Egypt in a position to give jobs to non-Copts. When we do, it's not likely we'd employ the same orthodox Moslems who abuse us with their numbers and their votes.

I slide into the back seat. A servant comes behind with a picnic basket the size of a bassinet. Given my own size, we two objects take up the width of the car.

Doors close with luxurious solidity, and Kumar drives off. I'm separated from my chauffeur by a screen of plate glass, and he doesn't ask directions through the pushbutton speaker. Instead he climbs

four blocks further into the suburbs and stops again at a gate in a wall of shrubbery.

My right door opens, and a young man presses in. "Move over, dear heart," he says. "I need more space than *this*."

I mask my confusion and turn my picnic bassinet sideways, to make room. The man sits and slams the door — everything very quick — and gives me a feverish kiss. "Would you like to see a movie?" he asks. Already his hand is fondling my left breast.

Is this Kassim? "What movie?" I ask. "Where?"

"Whatever's showing," he grins. He has a beard to try to look older, but I doubt he's more than twenty. His hand moves to my knee, my belly, and back to my breast again. I pluck it off. He wakens to the wider world and notices my basket. "We can bring your supplies into the family box. You can eat there."

"Must I eat constantly, then? Am I that sort of girl?" I've forgotten myself enough to ask this question, because I'm growing irritated with Madya's scenario.

Must I eat constantly, then? Am I that sort of girl?" I've forgotten myself enough to ask this question, because I'm growing irritated with Madya's scenario.

The man-boy smiles and pats my stomach. "Why deny yourself, eh? You've grown new inches, I think."

The car launches off. Kassim lets his name slip before we reach the crowded streets of older Alexandria. He seems mad for my body. His skin shines. He is bathed and trimmed and handsome, but his complexion is naturally oily.

Kumar eases up an alley and stops. Picnic basket in hand, Kassim escorts me into a back door, and up a stairwell. My heart pumps as I climb. I have to rest at the landing. I take the second flight of stairs in winded half-steps.

At last we reach Kassim's family box, furnished with ashtrays, spittoons, little tables, and plush chairs. He adjusts the curtains to conceal us from our neighbors — to conceal everything but a central sliver of the movie screen. Meanwhile, I sit to catch my breath.

He moves behind me and removes my shawl, my vest. I open my mouth to object, but now he's gone — and back again, with a picnic morsel to feed me. "What's your weight now?" he asks. "What's your size? How many inches? You know it delights me when you tell me these things."

I chew and swallow. "As if my fat body were a mutual project," I reply. Outside the box, the house lights dim. Advertisements begin to play on the screen.

He whispers now. "We'll get married, and I'll weigh you every week. I'll savor every pound." He moves a chair to my side and sits, and reaches an arm around my back to rest his hand on the shelf of my opposite hip. Nuzzled into me the way he is, he makes me conscious of how wide I am. I sit higher than he does, not because I'm tall, but because I have extra mass to sit on.

I sit, and endure Kassim's hands. All this sensation, touch and taste! All this physicality! No room *here* for my life of the mind. Madya has swamped me in mere flesh, and eating is a better distraction than the movie, an American musical about the building of a rail line in old Colorado.

Kassim stops pawing me. Someone has entered the box. There's an exchange of cash, and now we have champagne on ice. Afterward my boyfriend locks the box. "What if I need a bathroom?" I ask him.

"Do you?" He is prepared to be skeptical. "Have something to drink with those sweetmeats."

"When we're married, will I have champagnes and wines?" I ask. On the movie screen, miners are singing a paean to the ores of the Colorado Rockies.

Colorado again. The truth is obvious. Kassim hands me a glass. "Anything you ask for," he says.

I rise and take the bottle, because the glass is small, and I've drained it in one gulp. "I ask for *this*." Bridging space from the screen, the railroad tracks of the Colorado movie extend to our box, and I step forward.

Seeing me and my awkward progress — this fat redheaded girl with her clothes disheveled — the miners fall into confusion and cease their chorus. The movie audience howls objections. I huff and puff along the tracks toward the depot. The miners part to make way for me.

My master is sitting there. He's removed his sunglasses, now that the sun is low in the west. Perhaps he's surprised to see me in this form. It takes me a long minute to reach him. "OK," I wheeze, gasping for breath in the thin air. "Very nice, Madya. When did you do it to me? When did you trick me?"

"Excuse me?"

I take a swallow of champagne from the bottle. "How long has it been *you* teaching me the Kaballah, instead of the real master? My fellow students — they're all virtual fictoids, aren't they? Cunning imitations of my comrades. How long have I been fooled?"

"Have I been that unkind? The way you're frowning! Trying to wrinkle up that pretty little forehead." Madya-master laughs. "Ah, Youssef, you take yourself so seriously. The great abstract Kaballist! The man of restraint!"

I persist. "How long since I've fallen into your trap?"

"Since you began playing with those numbers of yours. No more than four days. I could have kept it up. Toying along with you for *weeks!*"

"But you didn't. You wanted me to know. You got tired of Youssef the Fool."

"Perhaps I grew ashamed of myself," Madya answers. "Always testing others. Making others prove themselves. I have 238 environments, did you know? I adapted one of them to this Colorado movie. I doubt you could escape me, if I were cruel. Every time you bridged to get away from one of my virtual scenarios, it would be to another place of mine on the far side."

"I devised 188 cyberscapes before I gave them up," I say. "Some were magnificent. I waited to show them to somebody. I waited to show them to you. But you were busy with your own creations." I waddle forward the last little distance. "What's the meaning of this?" I ask, gesturing at my bloated body.

Madya puts her hand over her face, concealing her eyes as she speaks. "Everything I do is an expression of my own experiences. You are men, all you students of the Kaballah. Men of the intellect, dry as dust, and lost to the flesh. What man among you could endure *being* a woman of the fantasies you try so hard to renounce? The fantasies where our sex is helpless and molded for erotic pleasure? I was that sort of victim, once, when I was a child in Gaza. That body?

It was just the first of my tests, Youssef. A lecture, if you like. A lesson in history."

"I wonder if I'd have passed your test. It's better that you relented. Thank you for your mercy. You can join the Kabal. I'm here to make that offer."

Madya looks around. "Must I destroy my worlds?" she asked quietly.

"When you're ready," I tell her. "It would be worse for your soul if you did it prematurely."

She stands, and takes my hand. "I'd like to make love with you, Youssef. I'd like to show you my 238 heavens, so you could know me through my work. I can be a damned good goddess."

"And then what?" I ask.

"Then I'll think about your offer. We've got 2,200 years. That's enough time for an important decision. I may even decide *no*. The new world we're flying to *needs* gods and goddesses, to sprinkle it with germs and plankton and fungi." She bends and gives me a kiss. "Come into my beautiful places. I'll even switch with you, and play the female again."

With a snap of her fingers she's a green-eyed redhead, tanned and trim, minus a hundred pounds or so. She twirls her skateboard, tosses it onto the tracks, and leaps so that a blink of the eye later she's rolling by momentum down a ribbon of steel toward the mine.

The miners scatter. I transit into one of them, and straddle his shovel like a witch's broom. Flying as fast as I can, I start to catch up.

Madya reaches the dark entrance. I'm close enough to share her transit — out of a tunnel of love, and into a landscape of old rose hills, rising knobbily from a wine-dark sea.

I reach out to her with my calloused miner's hands. Her skin is smooth and perfect. We embrace on a slope of flowers. I kiss lips beyond any lips in reality. "We have 2,000 years," Madya whispers. "Do you really want me to destroy all this? All your scenarios aren't gone. I'd like you to know that. Remember the few we shared a hundred years ago? I've kept them for the sake of memories."

"Is it only me you'd share your mind with?" I ask. "Please be greedier than that. Become a hunter of souls, and you'll enjoy two millennia of such dreams as this."

She shakes her head. "They won't be *my* dreams, not like what surrounds us now. They won't be my history, and without reminders I might forget what it is to be a human soul. I need sensation. I revel in it. More, always more! Not less like you. Away with your minimalism! I'm a goddess of creation, not destruction. I doubt I could ever join your Kabal."

"I'll make a bargain. I'll follow you through your 238 creations," I tell her. "Afterward, park them for a time. Put them in storage, and I'll introduce you to the master."

"Haven't I got you so seduced that you'd follow me anyway?" she jokes.

"Please," I ask again.

Madya trembles in my arms. "You're so confident of him! That frightens me. What if he turns me into a Kaballist? What if he can do it by words alone?"

"That's all he ever uses," I tell her.

She kisses me. Her hands move as feverishly as Kassim's. "He controls you. You used to be a god, always in control of your worlds."

"Total control is total loneliness," I answer. Her breasts are small and firm against my chest. They're the breasts of a girl much too young for the old man I used to be.

"This — *this* — is what I do for loneliness," Madya says. "It's better than words."

After some minutes she speaks again. "Why are you all males? All you students? So you can wander from one virtual orgy to the next? Like a bee from flower to flower?"

With an effort I find the power of speech. "It's our great failure. A pattern of failure — almost a system. We're doing something wrong." I've never made this admission before. Afterward, we make love among the flowers, in silence, or at least without debate.

A long time later she speaks again. "You have 2,200 years to learn to do it right." The setting sun casts purple shadows, and she strolls away, sharing the colors of rose and gold and violet that surround her. I follow and lose sight of her as she blends and dissolves.

She's gone. There'll be no tour of 238 creations, and no encounter with the master. She's afraid of that risk, afraid he'll convert her, and she has 238 places to hide. A lifetime ago we built Amsterdam together. Hoping it still exists, I work an artless transit to a small park, but of course she's not there. It's raining. I wander through the sailor's quarter, among the prostitutes and bars, and then to the train station.

Transit again.

Back in Colorado the master comforts me. Perhaps he's authentic. I repeat Madya's last words. "She's right," he says. "We have another 2,000 years and more to do the job better."

I feel sorry for him, sorry that he should have to spend so much time comforting his dozen disciples. Mixed with my sorrow is a nagging question: *Does the master really exist? Was he ever one of our 40,000 true souls from Earth?* Or is he merely someone's fictoid? If Madya fooled me, then I'm not qualified to answer.

Madya fooled me. I feel queasy in my stomach. How could she know the master that well? Despite her fears, she's made a study of him. Madya and the master! One of them — perhaps both of them — have hidden aspects. One of them — perhaps both of them — have lied to me.

What is truth? Lies are so easy. I fear my identity as a Kaballist is built on a lie. The master looks forward in confidence, but isn't he too good to be real?

The sane person builds from sensations outside himself, taking the world's shape for his own. If only that were possible! I feel certain: None of us will be sane twenty centuries from now. We'll have dissolved into fantasies. We can't make it to our new world. It would be better if we could switch ourselves off. Better if we could kill the computer that stores us.

I pause, waiting to be struck down by my ultimate blasphemy. Nothing happens. "Let's find you a new mission," my master says.

My doubts make him ugly. I don't bother to explain as I walk away, from Colorado to Amsterdam and from Amsterdam to a new scenario — a private universe I control completely. *"Let there be light. Let there be darkness."* Sanity is impossible, and Madya has won. There is no reality beyond myself. Where truth fails, the beauty of the creative act is all that's left. I feel sorrow and a sense of defeat. Madya has won, using arguments of color and flesh and excess. I put the Kaballah behind me. I have no choice but to become a god again.□

Nuzzled into me the way he is, he makes me conscious of how wide I am. I sit higher than he does, not because I'm tall, but because I have extra mass to sit on.

THE DEATH OF A STAR

BY JACK WILLIAMSON
Illustration by Bob Eggleton

"BONES!"

Back from the cave and out of his airskin, Andersen tossed a yellow plastic bag on the cabin floor.

"Bones of predators and bones of prey. Big bones and baby bones. Fish bones and worm bones. Round amphibian skulls and dagger-jawed monster skulls."

"But none of them human." Cruzet was wryly sardonic. "Not yet."

"The flying predators nested in the cave," Andersen went on. "Nothing else could reach it. The history of the planet must be written in the bones, if we knew how to read them."

Kip saw no bones, however, when he upended the sack. The thing that rolled out looked like a black honeycomb.

"Beads?" Cruzet squinted at them. "If the amphibians wore beads."

"I found one with every skeleton." Andersen leaned to look. Andersen nodded. "But I've no idea what they are. Harder than diamonds. Sticking together like magnets, with no magnetism in them. Unchanged, I think, by all the ages since the planet froze."

The honeycomb was a mass of six-sided prisms stuck together, side by side and end to end. He pulled one of them off, polished it on the leg of his yellow jumpsuit, and peered at it through a pocket magnifier.

"Still a riddle," he muttered. "I hope for answers on the icecap."

"If anything survived," Cruzet said, "a billion years in this deep-freeze."

"The amphibians, maybe. The beads and that old temple are evidence enough of a high civilization."

"No species lives forever. Back on Earth, ours must be over."

"But we're here." Andersen polished the bead on the sleeve of his jumpsuit. "And something on the ice did flash that signal."

"Warning us off?"

"Or inviting us to land?" Andersen fitted the bead to his head just behind his ear, and tossed the one he had worn at the plastic sack. "The flash panicked Stecker. Our coward for a captain — "

"Let me look." Day had been asleep on the berth behind the curtain. Pushing past Kip, she snatched one of the beads and stuck it to her head. Kip cringed away from her. His little sister, or at least she had been. The beads turned her into something that frightened him. They glazed her eyes and changed her voice and gave her ideas he didn't understand.

"Me Me!" Her voice was shrill and strange, not at all her own. "She's lost and freezing on the icecap, with the black things after her. We must help her." Her tone was suddenly commanding. "Drive us on."

His little sister, only five years old.

"Andy!" Kip caught at the sleeve of Andersen's jumpsuit. "Dr. Cruzet! Please! She's crazy with the beads. Don't listen — "

Andersen didn't seem to hear. He and Cruzet had seemed almost human while she was asleep, but she was commanding them now. Feeling sick about her, helpless to do anything about it, Kip could only watch. He saw a black bead fall and skitter across the floor as Cruzet picked up the plastic bag and stowed it in a locker.

"There's one." He pointed at it. "Don't you want — "

They weren't listening. Not to him.

"Come!" Day called to Andersen, her voice cold and strange. Nodding for him to follow, she led the way forward to the pilot bay. Cruzet went down to the power bay. The turbine hummed. The spider lurched and glided on across the starlit frost.

LEFT ALONE IN THE CABIN, KIP FELT trapped in a monstrous nightmare. The flight on the quantum ship had been a wonderful adventure when he went aboard with Day and their mother, just a few weeks or maybe a billion years ago — the time paradoxes still bewildered him.

It flew as a virtual quantum wave at the speed of light. Time stopped aboard, leaving the crew no control. Only a powerful gravity field could reverse the drive field and end the flight. They had hoped for the field of a sunlike star with some friendly planet they might reach.

It had been the black star instead, and they had come down on this frozen planet, dead since Earth was born. Digging through the permafrost to make a habitat where they might stay alive, Dr. Singh had found the first beads — if they were beads — buried with the bones of amphibian creatures that perhaps had worn them. She studied them till they killed her.

They had taken his sister next. Convinced her that Me Me had followed her from Earth. A crazy notion. Me Me was the panda doll she had to leave back at White Sands because it exceeded her weight limit. Believing that the doll was lost on the ice, she had come aboard the spider, walking in her sleep and bent on rescue. Kip had followed her, trying to wake her. The beads had not let her go.

Left alone in the cabin now, he climbed the narrow steel stair into the transparent bubble. The heat lamp, high on its mast, was a dim red sun among the stars overhead. It made a pale red glow around the spider. Beyond that, the starlit frost reached out to the midnight sky, unbroken by anything.

He sat down at the narrow navigation table, listening to the turbine's steady hum, watching the faint track the tires left behind, wondering about the bones. Were the amphibians still alive? Guarding the planet and flashing keep-off warnings? More likely, he thought, those giant flying predators had killed them all before the planet froze.

Cruzet and Andersen wanted answers. At least when Day was asleep and they were almost themselves. What she wanted, or what the beads wanted, he had no way to know. His head ached from wondering.

He wanted his Game Box and its exciting adventures with Captain Cometeer. None of them was quite so strange as this drive to the icecap, but they were thrilling enough, and he could always hit the exit key. The box was back on the ship, and he had no key to take the beads away.

The spider rolled on. The turbine hummed. All he could see anywhere was the empty ice ahead, the faint track the tires left behind, and the blaze of strange constellations overhead. Half asleep, he stumbled out of the navigator's chair when Cruzet came up the steps. Without a word, or even seeming to see him, Cruzet sat at the desk and picked up the binoculars to sweep the ice horizon.

Feeling uneasy there, he went back down the stairs and looked into the pilot bay. Andersen stood at the wheel, stiffly straight, watching the compass and the gauges. Day sat on the monitor beside him, as still as a doll, her glassy eyes fixed on the frost ahead.

"Andy, I'm hungry." Andersen didn't answer, and he raised his voice. "Can't we stop to eat?"

"Broken ice ahead." It was Day who spoke, in that cold toneless voice that wasn't really hers. "Steer twenty-two degrees right for the next two hundred kilometers to get around it."

His little sister. How did she know there was broken ice two hundred kilometers ahead? Of course she didn't. The bead behind her ear was talking. Shivering, he went back to the cabin. There was nothing he could do about the beads, but he still felt hungry. Looking in the food locker, he found a box of soyamax crackers and a can of citrajuice powder. He mixed a cup of juice and ate the dry crackers with it.

They were almost good. He felt sleepy again. Keeping as far as he could from the black bead under the curtain, he crawled onto the narrow cabin berth and lay there with his back to it. He tried to forget it, but it was always there. He lay a long time wondering what was waiting on the icecap ahead, until he finally slept.

HE WOKE WITH A JOLT.

Something had happened to him. Somehow, the cabin was gone. He lay out in the open, with no airskin. He was numb with cold. His whole body felt strange, so stiff he could hardly lift his head, yet somehow he was still breathing. Stars shone in the west, but the sky was brighter toward the east, purple-blue overhead and blood-red around the sun.

The sun —

No longer black, swollen to three times its size, it glowed like red-hot iron. It was mottled with ragged dark splotches that made an ugly face. He lay shivering under its heatless glow.

Too cold and clumsy to stand, he got his arms beneath him and raised his head. He found himself sprawled face down on something flat and hard. Metal, maybe, though the color was an odd yellow-green. It floated in a pool of dark water rimmed with a jagged wall of ice that glittered dimly from the crimson in the east.

Pushing higher to look beyond the wall, he saw a flat field of ice that reached as far as he could see. Turning stiffly toward the west, he found a square black shape far off across the frost —

Skygate!

The place of the changers.

He had been confused for a moment, feeling lost and out of him-

self, but the sight of Skygate cleared his head. Certainly he was growing old and stiff and clumsy, but at least he knew where he was. He had always known Skygate. The holiest place. It stood empty and abandoned now, since ice had closed the ramp, but ten thousand generations had come here to change in the ages before the ice. He had never been closer, but his father had stopped to see it after he changed, and came back amazed with its wonders.

The vast ramp where so many millions had come out of the water to shed their sea skins. The tall mosaic walls set with gemstone pictures of the metamorphosis. The balconies where the skylers could perch and the high windows where they could enter the temple. The vast black stone blocks of the rear wall, deeply carved with skylers trying their new wings, and the monstrous blackwings diving to kill them.

The skylers had brought the raft when the ocean froze. Its feeble heat was enough to thaw the ice around it. A sloping ramp on one end helped the changers climb out of the water, and a high perch at the other end let them spread and preen their wings before they tried to fly.

His name had been Sea Searcher once, but he was only Watcher now. Good for nothing else. He had lain here too long, watching for the blackwings, starved and desperate since the long freeze closed their fishing grounds. He had dived again and again to warn his mate when they were diving at the raft. She was Wave Rider; her name had come down from long ago, when waves still ran on liquid seas.

He watched too, and hopefully, for a skyler returning. Born in the sea, his people lived here through the first stage of life. The change gave them wings to reach the Shadowland. New skylers always promised to come back with lifestones for those they left behind, but nobody had ever returned with one for him. Now that his own time for change had passed, his desperate hopes were for Wave Rider and their son.

Desperate because their time was running out. She had gone down for fish, but the long freeze had killed most of the fish. The air-gaspers had vanished with the open water. The deep-swimming silverfins had grown rare and wary. Far Diver had always gone deeper to dig in the sea mud. He searched for the bones of some unlucky skyler who had drowned with a lifestone on him.

"Watcher! A gift from the Eternals!"

Wave Rider's head had broken out of the water. Scrambling to help her up the ramp, he ached with pity for her. The beauty he had always loved still glowed in the fine bones of her face and the light of her unshielded eyes. Her velvet fur was still dark and sleek, but he felt her bare ribs when she nestled against him. The best fisher of the three, she had shared too much of her catches with their son.

"Silverfins!" Elation lifted her voice. "I thought the last of them were gone, but I caught these inside the reef. One sonic shot got them all." Anxiously, she peered around the raft. "Far Diver? Isn't he back?"

"Not yet. He stays too deep and too long."

He drew her closer, listening to the slow rush-and-sigh, rush-and-sigh of the air the dive had starved her for. Proudly, when she had recovered enough, she spilled three small fish from her pouch.

"The Eternals!" Her crest bent in reverence. "They saw our need, and found a fish for each."

She laid the largest fish under the perch to keep cold for Far Diver.

"Our splendid son." She gave Watcher the middle fish, and kept the smallest for herself. "A gift of the Eternals, yet he has always hurt my heart. Too proud of his endurance when he was young, too daring in his ventures out under the ice, always probing for some forgotten wreck sunk too deep for salvage. So unhappy now, because he has never found a mate."

"Yet always hopeful," he tried to cheer her.

"He never will," she muttered bitterly. "Because none is left for him to find."

"Nobody, perhaps, here in the sea. What he wants is a lifestone, and his chance to reach the Shadowland."

"I remember." Her eye shields closed, she relaxed against him. "Remember when he saw the lifestone your father found. He was still a tadpole then, no longer than my flipper, but the stone fascinated him. He had to touch it, and he asked what it was.

"A second brain, your father told him, that would wake his body for life in the air. Your father told how he had found it in the wreck of a skyler ship that went down when skylers still sailed the seas. He wanted to know how the skylers made the stones. Grew them, your father said. Grew them out of their skulls in the third stage of their lives.

"He listened to all that with his eye shields wide. Wider when he watched your father struggle out of his own sea skin. He made me hold him high to let him watch your father fly away across the ice toward Skygate and the Shadowland.

"'I'll learn to dive the way he did,' he told me. 'I'll swim out under the ice till I can find my own lifestone and follow him to the Shadowland.'"

"So long ago." A wistful sadness edged her voice. "Just a tadpole then, but he never forgot. He was always diving deeper than anybody else. Digging up the sea mud as soon as he could reach it. Searching the rotten hulks of buried ships for lifestones he has never found — and never will."

Lying huddled against him, shivering a little from the frigid air she had been gasping, she raised her shields again to sweep the sky from the blood-stained east to the stars over Skygate in the western dusk.

"Never will," she murmured again. "Because our world is dying. I think we three are the last still in the sea. As for the skylers — " Her crest quivered with doubt. "I've watched friends change since I was a child, and listened to their promises. Nobody has ever come back. Not even your father."

"A hard time." He tipped his head toward the heatless sun. "A cold time. A hungry time. But Far Diver has the heart we've lost. The long freeze may never end, but he'll keep on pushing farther, staying longer, searching deep, till he finds his lifestone."

"I hope." She sighed. "I try to hope."

"I HAVE IT!" THAT TRIUMPHANT SHOUT rang from the water. "A perfect lifestone!"

Far Diver plunged to the foot of the ramp. Rider moved to help, but he needed no help. Climbing the ramp before she could reach him, he held up his fin flexed around the bright black prism.

"Take it, Mother. Keep it safe."

He sank flat on the raft, drawing long gasps of air and shivering from its bitter chill.

"You distressed us," she told him when he had revived enough to lift his head. "You were down so long."

"The wreck I found." He spoke between the gasps. "A long way out. Too far for me to get there again. Sunk very long ago. Our world different then. Nothing is left of the craft itself. All I found was cargo that couldn't decay. Glass, porcelain, gold."

He dropped flat again, and she waited to let him breathe.

"Tell us," she urged when his shields came open. "About the stone."

"Those other relics first." With an affectionate bow of his crest he reached to touch them both. "Wonderful porcelains. Paintings on them showed people without wings. Living on land that had no ice. Scattered with queer green towers. Trees, I think, that grew in Shadowland before it was Shadowland. The sun was larger in the paintings, and brighter. Sometimes low, sometimes high. I think because the world was still turning."

"The lifestone?" she asked again.

"I dug there in the mud. Searched and dug again till my light began to dim. Found no bones, no stone. Dug till I was dead for air. Had to give up. Swimming back, I came on something I never expected. Bones scattered over a high coral knob. Bones of a blackwing, the skull and the claws and a dagger-fanged jaw. And a skyler's skeleton."

"The stone?"

He reached his fin for it, and offered it to Watcher.

"Father, for you."

Watcher's shields quivered and closed with emotion. He blinked till vision came back, but a proud admiration dazzled him again when he looked at his son. Handsome as always, Far Diver was drawn lean from hard toil and long hunger, but still muscular and fit, strong enough to dive again.

Young and fit enough to change.

"A noble offering." Crest bent deep, he waved the stone away. "A gift to earn you the light of the Eternals." It would prove devotion, if that needed proof. It never did. "But I have lived long beyond the stage for change. Give the stone to your mother."

Far Diver offered it to her.

"For you, my loving mother, if my father wishes."

With no move to take it, she wrapped them both in her swimming fins.

"My good . . . good son." She was shaken with emotion, her voice a broken wheeze. "You offer more than I can take. The stone is your own life. Your chance for Shadowland. I love you for the offering, more than I ever did. But I can't leave your father here to die alone. The stone is yours. You must use it while you have the strength to change."

FAR DIVER SAID AT FIRST THAT HE couldn't leave them.

"You go for us," his mother said, "as much as for yourself. Your life in Shadowland will be your greatest gift to us. The will of the Eternals."

"I will come back," he said. "I promise that."

He ate the fish they had saved for him. Still restoring himself, he lay a long time asleep in the sun's dim red glow. Once his swim fins flapped, and he gasped as if after another dive. Relaxed again for a time, he cried out as if in sudden pain.

"He's dreaming," Rider said. "Waking."

He lay quietly again, however, and dreamed again before he raised his head.

"Strange dreams," he told them. "Dreams of my own transformation. I thought the time was long ago, long before the ice closed the way to Skygate. My friends made a feast for me when my change time had come. I left them at sunset to swim to Skygate and crawl up the ramp. The mosaics on the wall prepared me for the transformation. Free of my sea skin, I learned to use my wings and flew west toward Shadowland.

"The world still turned, though slowly. The sun was larger then. hotter. It climbed as I flew, stood at noon before I reached the continent. The long night had buried it with snow, but except in the high mountains most of that was gone. Green forests covered most of the great central valley. Farmlands surrounded high-walled towns.

"I was tired by then, famished. I came down in the middle of a town. The skylers welcomed me, begging for news of their seaside families and friends. I stayed there a long time, learning the ways of the green side, working on farms to pay for my keep.

"The skylers seemed prosperous and happy, but they had good reason for the walls. Their enemies are the flying monsters we call blackwings. The blackwings are form-changers, as we are, with two stages of life. The young are wingless wormlike things with savage jaws and voracious appetites. They are hatched in the night. When day comes, they swarm over the land, devouring everything.

"The skylers were already getting their crops inside the wall. They had need for haste, because the larval monsters, the killer-crawlers, came swarming in soon after I arrived. They ate the stubble in the fields to bare clay, ate the leaves off the trees, killed and ate every animal they could surround, finally attacked one another.

"They terrified me, but the skylers have learned to survive. The towns are well defended, and the cold nights kill any crawlers that fail to grow wings in time to reach the sea before darkness falls. I volunteered to join the soldiers on the walls. They told me I was needed more at Skyhold.

"That's their great fortress city. It stands on a high mountain ridge at the center of the continent. High mountains and higher walls defend it. Many of its levels are carved deep into the granite below, and its towers are so tall the ice can never cover them. The crawlers are no threat to it; they don't climb so high or get so far from the sea. Skyhold was planned to stand against greater dangers, designed to keep the race alive forever, even after the sun has cooled to extinction and death has claimed the planet.

"A hundred generations of workers have been toiling to complete it. Joining them, I ran a machine that nullified gravity, I never learned how. Using it, I could lift enormous masses of stone from the quarries. But not to the wall. Common granite was too fragile for Skyhold. It had to be powdered, mixed with other materials, molded finally into gigantic blocks of something harder than diamond and tougher than any metal.

"Working there all the rest of the day, I learned to be a skyler. I made good friends, and met Lifestar. We expected our love to last forever; we hoped in fact that skyler science could give us actual immortality, perhaps elsewhere in the universe. Our dying sun has no other planets, but the skylers were hoping to reach some kinder world. They had built an interstellar ship, gravity-driven.

"We volunteered to go on its first flight. Accepted for the crew, we went aboard together. The ship lifted. The planet fell away and vanished. We were safely out in space, with stars blazing all around us, when I woke. My heart still aches from the pain of that bitter instant when I knew that my beloved Lifestar had been only a dream, now lost forever."

Far Diver stopped with a dismal sigh, his crest drooping.

"A PROPHETIC DREAM, I THINK," WATCHER SAID. "THERE IS A TRADITION of very vivid dreams which seem to come from lifestones and foretell the future."

"It was vivid enough." Diver nodded forlornly, turning to his mother. "Lifestar was real and dear as you are."

"We heard you cry out," she told him. "A cry of pain."

"Pain sharp enough, when I knew she was gone." His eye shields closed for a moment, and his swim fins shivered. "But there was a second dream that hit me just as hard."

He lay silent, remembering.

"It began right here, when I dived off the raft this last time. I thought I'd found that wreck again. The gold and glass and porcelain. Again, no bones. Out of breath and rising, I found the skeletons on that coral knob. The skyler's and the blackwing's — but this time I found an anklet around the skyler's shin bone. I knew the anklet. A guardian at Skygate had given it to me. I thought the skeleton had been my own."

"A dreadful dream." Rider's fin caressed him. "We should have waked you."

"I slept on through another dream. Prophetic?" His eye shields blinked at Watcher. "I hope I never know. Again the time was far past. The planet still turned, but even more slowly. Those ragged black scabs had covered most of the sun. The seas were already freezing, and the few of us still left had to spend the endless nights breaking the ice from the holes where we came up to breathe.

"We were always hungry, with most of the fish already gone. I was diving with three friends, looking for lifestones, hoping for our chance to reach the green side of the old epics. We found a stone. I won the game we played for it. The losers lifted me on an ice floe for the transformation, and wished me the light of the Eternals.

"High overhead when I left, the black-scabbed sun sank lower as I went west, till I was flying into freezing twilight. The long day had thawed much of the sea ice, but the world seemed empty of life. No blackwings rose to attack me; perhaps they were gone, with no prey left.

"No longer the green side, the great continent was buried with snow. No skylers rose to welcome me. The valley cities had vanished, with the killer-crawlers that once swarmed around them. The cold grew savage as I pushed on. At last, flying under brilliant stars, I came to Skyhold.

"The mythic fortress of the skylers. It stands on high mountains. Its walls have no gates. They rise out of the glaciers, so tall the air was too thin for my wings before I got over them. The towers inside are dead black stone, higher than the wall, with steep-pitched roofs to shed the snows. Sealed against time and change, they have no doors, no windows. I saw no lights, no motion, not even a balcony where I could rest.

"I flew on and found no skylers anywhere. Nothing alive, till I was back above this half-thawed sea and saw a blackwing diving after me. Drawn with famine, it flew so clumsily that I might have escaped if I hadn't been so cold. It caught me, with no strength to carry me. We went down together."

FAR DIVER HAD LAIN FLAT ON THE RAFT AS HE SPOKE, EYE SHIELDS nearly closed. Moving now, he raised his head to stare silently out across the empty ice field under the dim crimson sun.

"Frightening dreams." His mother's crest quivered. "I don't understand them."

"Memories?" Watcher asked. "Memories of skylers who had worn the stone before you found it?"

"Perhaps. Perhaps that's why they seemed so real."

"Do they trouble you?" Rider asked him. "About your own change?"

He turned to gaze at far-off Skygate and the faint stars above it.

"No matter." His lean shoulders lifted. "We've no future here. Nor anywhere, unless I find our people still surviving. It hurts to leave you, but I must go."

He embraced them both. They drew aside to watch him burst free of his sea skin and climb to the perch. The gauze of his spreading wings dried swiftly in the bitter air, and Rider shuddered when the red sun touched them with the color of blood. Wavering a little at first, he circled close above them, calling another promise to return, and flew off to vanish among the faint stars in the dusk-dark west.

"A good son," she murmured. "He will be back."

"I hope," Watcher said. "With a lifestone for you."

With nothing else to live for, they waited for him. Although Watcher denied that he was hungry, Rider dived again for silverfins. She came back with none, so weak with long starvation that he had to help her back to the ramp.

"My last dive," she whispered when she could. "No matter anyhow. The silverfins are gone."

She saw him moving toward the ramp.

"Don't go down!" she told him. "You've no more strength than I do."

"Just for mudworms," he told her. "They're full of grit, and they taste like mud, but they can give us strength."

He dived to search the mud banks toward the coast and found none of the tiny pits that marked mudworm siphons. Like the air gaspers and the silverfins, they were gone. He made it back to the raft, but his leap for the ramp fell short.

"Diver!" Rider called when she saw him, vibrant with joy. "He's back! I see him over Skygate."

She helped him on the ramp, and he saw their son returning, flying low above the far black block of Skygate, his wings a fleck of crimson in the sunlight.

"Our magnificent son!" Rider was radiant. "Perhaps with good news for us."

Or perhaps himself in trouble, Watcher thought. Flying too low and too slow, laboring to stay aloft. He said nothing to dim her delight, but her sudden sobbing cry was crueler than the cold.

"No! No! Pray the Eternals to save him."

The blackwing dived from high behind him, a thin black arrow in the somber dusk. Too late, too feebly, he swerved to evade it. Its talons caught his right wing. They struggled, tumbling in the air.

"A clumsy strike," he whispered. "It must be weak with hunger. I think he has a chance."

Their bodies separated, but his wing was mangled. Side by side, they fell to the ice.

"That dream." He shivered. "His dream of the skeletons on the coral knob. It was prophetic. The stone was warning him."

"My precious son." She moved toward the ramp. "I must go to him."

"You can't!" He caught her fin. "It's too far. You aren't able — "

She broke away from him and dived off the ramp. Her first leap carried her only halfway up the slippery rim of the pool. She splashed back, dived, leaped higher. Safe on the ice, she got her breath and swayed to her feet.

He was moving toward the ramp.

"Don't!" She raised a fin to halt him. "You've no strength for it."

That was true. He sank back to the deck, eye shields shut with shame for his weakness and his age. She was still there when he could see again, waving a silent farewell. She turned when she saw his answer, and set out across the ice.

Helpless, he could only watch. Far Diver had fallen far across the frost, and it took her a long time to reach him. Starved too long, her sea shape never made for walking, she fell and rose, fell and rested and rose again, till at last she dropped beside the crumpled body and did not move again.

Watcher lay alone and blind on the raft, his eye shields closed, till he ceased to feel cold or hunger, grief or pain, till he had no will to move again, till memory and emotion darkened and he knew his world was dead.

HE SAT UP AND RUBBED HIS EYES, blinked and rubbed his eyes again. The raft and the ice and the dull red sun had vanished. Half of him was still the Watcher, filled with a terrible sadness for Rider and Diver and their dying world, but he found the cabin of the spider, not quite real until he saw the bright black gleam of the amphibian bead still lying under the hem of the curtain. A lifestone. He shrank from it, shivering. Perhaps it had lain a billion years with the bones in the cave skylers, but something in it still survived.

"Kipper? Having fun?"

Andersen came out of the control room doorway. Day hung limply in his arms, fast asleep. He paused a moment before he walked on to open the curtain and lay her on the berth behind it. He seemed relaxed and cheerful, that glazed intentness gone from his eyes.

"Fun?" Kip pointed at the bead on the floor. "Not with that thing here."

"If it bothers you ..."

He picked it up, frowned at it for a moment, and stowed it in the locker with the others. Glad to have it out of sight, glad to be almost himself again, Kip felt the Watcher's sadness lifting. The hum of the turbine had died. The spider had stopped. Cruzet was at the kitchen counter, humming no tune as he made breakfast.

"OK, Kipper?" Andersen peered down at him. "You look a little woozy."

"I'm OK," he said. "OK now."

"I know bad things have happened." Andersen seemed warmly concerned. "But they're all behind us now. We're on our way to the continent. Mountains and glaciers to climb. And the mystery of that spectral signal to crack."

"What do you think we'll find?"

Skyhold? The skyler fortress he had seen in the dream, built to stand forever? And something in it still alive? Something using the power of the lifestones to defend the frozen planet?

"Exciting, don't you think," Andersen urged him again. "Better than your games with Captain Cometeer?"

"Maybe," Kip said. "Maybe."

This was no game. He had no exit key to end it. The bright black gleam still shone behind Andersen's ear. He decided to say nothing of the dream. But he was alive and warm again, no longer the Watcher. Andersen and Cruzet seemed almost human as long as Day was asleep. His mouth was watering to the scent of the frying ham. They were on their way to Skyhold. Perhaps it really was a great adventure. □

334 MANCHESTER LANE

There's no place like home, especially when it's smarter and stronger than you are.

BY ROBERT REED
Illustration by Greg Carter

WILL WE ALWAYS be afraid? asks the wife.

Hey, nobody's afraid, says the husband. Besides, our neighbors are cowards. They won't do anything 'til the sun goes down.

Which means soon, she observes.

Now Jeldy, he says.

Don't 'now' me, she says.

Quiet please, says the architect, glancing at them. Then he turns to the control panel, asking me: Are you awake? Do you know where you are?

I am awake, yes, and this must be 334 Manchester Lane.

The people seem heartened by the sound of my voice.

Good, good, the architect remarks. Now examine yourself, please. I have no roof, I discover. My floors are uneven, impermanent sheets of pressed cellulose. Naked plastic studs — the bones of my future walls — glow white in the evening light. Panels of cultured walnut have been left stacked on the shaggy, half-wild yard. Lifting robots and ant-shaped carpenter robots huddle around electrical outlets, recharging spent batteries. I am sentient, I decide, but curiously incomplete. I feel surprise, even concern. Yet my voice is smooth and professional, asking all why I have been installed now. Isn't it rather early?

Not particularly, the architect claims.

You're a precaution, the husband assures me. That's all.

My software helps me interpret human faces, and voices. The only honest face belongs to Jeldy, the wife. But she says nothing, and I can't guess why any of these people would practice duplicity on me.

With measured firmness, I tell them about my surprise.

The architect dips his head — a sign of shame — and mentions vague difficulties involving this construction site.

Just some vandalism, says the husband.

It's not *just* vandalism, Jeldy confesses. They don't like us. They're trying to drive us away.

You don't know that, the husband complains.

They hate us, she maintains. They hate us!

The argument feels old, and practiced. I interrupt, pressing them for details.

The architect takes a deep breath, then admits that there have been threats. Look in your security files, he says. I find digital images showing a house being napalmed, flattened by a nuclear blast, crushed beneath a giant's gangrenous foot, and a dozen other destructive and criminal acts. Vicious prose accompanies the images, words calculated to shock and disgust: Emotional terrorism, and utterly illegal.

They hate us, the wife repeats.

Except no human is shown in the digitals or even mentioned. These violent activities involve property. Specifically, they involve the house at 334 Manchester Lane. Which is me.

The architect coughs weakly, then admits that it was his decision to install me almost two weeks early.

I take an inventory; a mere 30 percent of my security hardware has been installed.

But you won't have any trouble, the husband promises. Now that you're on the job, they won't dare try anything. They won't!

Who, I inquire, are *they*?

All three people look in the same direction. Past my skeletal walls, beyond the overgrown yard and an eroded stone fence, are little houses at least a century old. Wheeled automobiles are parked on driveways and yards. A general weathering implies a working-class poverty. This is an urban recolonization zone. Tax incentives and grant money have lured my owners here. I am their home's mind, a sophisticated AI unit tucked inside a ceramic shell set three meters beneath the new basement floor; my body is composed of plastic bones and my eventual roof, and the spacious yard, reaching out to property lines that I know by heart — lines defined by law; lines that are the same as skin to me.

You'll be fine, I am told.

Both men say so, working hard to be believed.

Honey, says Jeldy, it's starting to get dark.

So what? he replies. Ask me if I care … !

Yet he is first to walk toward their luxury skimmer, shouting haphazard words about seeing me in the morning, bright and early.

In a tone of careful confidence, I suggest to the architect that he rent several security robots, if only for tonight.

He says nothing, eyes dropping in that telling fashion.

It's honest Jeldy who admits that three top-grade robots were rented last night. This morning, two were found dismantled in a storm sewer. And the third robot is missing, the poor thing … .

She drops her head, sighs, and walks toward her waiting husband.

I've used proven forensic techniques to analyze the digital threats, I tell the architect.

And what did you learn? he asks.

The precision of detail and relentless vulgarity point to a sobering conclusion: Humans did not create them.

The architect tilts his head, asking: Who then?

The local houses themselves, I propose. For some unfathomable reason, their AIs seem to resent my presence here.

No trace of surprise shows on his face. With a soft, even voice, he assures me that I am more than a match for this neighborhood and its half-sentient AIs. He has faith in me. I will easily survive the night, he promises, but his blinking eyes and the nervous motions of his fingers hint at nagging doubts.

Then the husband sounds the skimmer's horn.

The architect leaves me, climbing into the skimmer and the skimmer passing through a wide ornamental iron gate that I close with a thought; and I lock the gate with its rusted latch, knowing that the very tired, very ancient metal can stop nothing, but the symbolism essential nonetheless.

THIS NEIGHBORHOOD IS SMALL AND OLD and uniquely isolated.

It is a triangular island bordered by three crisscrossing arterials, skimmers and wheeled vehicles streaming past at all hours, their engines partly muffled by trees and my antinoise generators. According to public records, these homes were built in the 1930s and '40s — trim and durable shelters intended for lower middle-class families. A quiet, tidy respectability ended with the new century. At its worst, Manchester Lane encompassed several drug and flesh emporiums. But then came effective new counteraddiction treatments and a shift in public passions. Respectability is returning, however slowly. According to yesterday's census figures, the local humans are a sociological stew, including the half-employed, the infirmed, and immigrants of vague legality. Neighborhood crime rates are on the wane, yet the inner city remains dangerous by any civilized measure.

Local homes are conscious. But their AIs are older models, updated by tinkering amateurs, and no doubt engorged with shadowy software, untold mental chaos being the result.

By contrast, I am the acme of home AIs. Not only can I handle anyone's data needs, I am perfectly suited for security work. When fully equipped, I will wield a powerful array of senses and defenses. Any young couple would sleep well inside their dream house, knowing I am on duty. Even if the worst happened — complete civil insurrection — I can protect them, and myself, in an armored bunker set beneath my basement floor. AIs much like me saw their families through the Waco riots and the Great Long Island Massacre — two successes that I might well mention in the morning, given the chance.

For the moment, I am unfinished. And that salient fact must be obvious to prying eyes, whether human or glass.

Moments after my owners depart, I receive a coaxial call.

My number carries a grade-3 unlisting. Tracing the caller, I reach an unlikely address in New Delhi. As the second ring begins, I answer with a simple nondescriptive: Hello.

Silence.

This residence is under construction, I warn the silence. I am only a recording, and good evening, I say; then I disconnect.

Persistence is a mark of machines. In the next nineteen minutes, I receive several hundred calls from around the world.

But the subterfuge breaks down. My expert traces eventually lead to a single nearby home. In response, I file a grievance with the local coaxial commission. Fines are a certainty. Harassment can be a felony, and even the dullest AI should appreciate the consequences.

As if on a signal, the calls cease.

Night has fallen. My eyes dilate or shift into the infrared. My yard is narrow but deep, covering the neighborhood's sharpest green point. Pine trees and half-wild privet hedges obscure the adjacent thoroughfares. Oaks loom over a lawn of rank grass and volunteer saplings. A tall, stately Victorian mansion once stood on these grounds, but it was abandoned long ago, condemned, then finally burned down by arsonists just last year. The same arsonists could be living nearby, I reason. Emboldened by the darkness, no doubt. Perhaps already stalking their latest quarry … .

I study my neighbors, human and otherwise. With the eyes closest to the street, I watch their lights come on. I peer inside windows, lit or not. Simple security cameras are visible, perched in the expected hiding places. Inexpensive models, I realize. Unexceptional. Yet to be cautious, I show them nothing of my nature.

Again, I receive a call.

My trace leads back to my owners; they probably want to be reassured about my good health. But my Hello is met with silence, then an electronic shiver as a phantom, a disembodied burglar, manages to slip inside me.

It is a muscular, graceless burglar. I let it search a tiny portion of my self, finding nothing but simple, dull circuits.

Eventually it retreats.

Burglars always leave footprints. In soil, as heat on pavement, or in the form of delicate magnetic residues. I record the residues to help any future prosecution, and only then, by accident, do I notice the message written inside them. It reads:

We aren't fools, neighbor.

It tells me:

We can see you. We can see you now.

THE NEXT INVADERS ARE AMONG THE MOST amoral, savage creatures spawned by modern society.

Ten-year-old boys.

Every security AI knows that boys are singularly adept at havoc and mayhem. Three boys, I count. They slip over the low stone fence, then crash through a wall of unpruned honeysuckle. Long sticks are brandished. Tall grass and low branches are beaten for no reason. High-pitched voices throw out dares. Go here, there, do this, that. The largest boy assaults one of the sleeping carpenter robots, then the others have to help him. And all giggle, joining ranks, small round faces finally turning to look at me.

When the first scuffed shoe touched my property, I called 911. A police officer is en route. Avoiding violence is my first objective.

Violence is the terrorists' only goal, however.

Everything looks the same, says one terrorist.

But I saw 'em working today, says another.

The largest boy shakes his head, saying: They put its brains in today. My house told me they did.

Yeah? say his partners. And what else did it see? Delivering another sharp, ineffectual blow, the largest boy says: These carpenters here tore down our treehouses, too. Tore them down and ate our fucking lumber … !

Any wood recovered from any inelegant playpens was scrap, and it never belonged to them.

Bastards, the boys mutter, believing they have legal rights here.

Come on, says the lead terrorist. Let's have a look inside.

I speak, finally. With an authoritative, forceful voice — a voice designed by Harvard psychologists — I warn the boys they are trespassing. I tell them to stop and turn and leave. Now.

I will defend myself, I promise them.

The effect is immediate, and puzzling. The boys giggle and punch each other, repeating my words with a mocking tone.

Police have been summoned, I say. I fully intend to press charges.

Words mean nothing. The boys climb between the white studs, careful not to help one another. Then they pause, sticks in hand, surveying my future family room, their stances arrogant, maliciousness seeping from their eyes and smiles.

One boy shoves his stick under a floorboard, trying to pry it free.

I use my riot foam.

Hidden jets emerge from the room's corners. A viscous gray fluid strikes, then expands, sizzling like hot oil and drying rapidly in the warm evening air.

Curses soften, then vanish. Again, I call 911. Where is the promised officer?

Delayed, I learn. A terse AI dispatcher informs me that trespassing is a no-priority crime.

But the neighborhood has been alerted, it seems. Three men suddenly appear at the front gate, scaling it and running up my driveway. They are panting, and angry. Judging by appearances and their emotional state, they are related to the terrorists. Fathers, perhaps. Labored breathing implies infrequent exercise. Fragile health is very much a symptom of the working poor.

The consummate professional, I tell the men what has happened, and why, making certain to stress the boys' criminal intentions.

Intentions? one man shouts. How in hell do you know what they were thinking?

As a precaution, I once again deploy my foam jets.

Women arrive at the gate, shouting questions about their sons' well-being. Females are oftentimes more tractable than males. In a show of good faith, I open the gate for them. The boys are fine, I promise. They want to see their boys. Again, in good faith, I allow my guests to use pry bars. I coach the fathers in the work. Once dislodged, each boy vomits; but that is a normal response to the foam, I assure everyone.

The fathers resemble their boys, standing with pry bars in hand.

Only then, at last, does a police skimmer pull off the thoroughfare and up into my drive.

I greet the officer, one professional to another. Yet she appears rather irritated with me. Dressed in black body armor but showing no weapons, she kneels and asks the boys if they are all right, then listens as they create a fiction about being curious and meaning no harm. In my defense, I offer to show digital recordings of their trespassing as well as a statistical analysis of their vicious faces. The officer seems unimpressed. Gazing at my nearest eye, she asks: Just what do you want me to do here? What are you after?

These boys should be taken into custody, I reply, citing appropriate statutes.

I can't hear you, she tells me.

I repeat myself, word for word.

You can't hear me, she says. Then she turns and sends everyone home, including the boys. This land isn't yours, she tells them. Like it or not, the law is rather clear about that.

No one is arrested; her attitude is most distressing.

Angry voices fade into the distance. Then she glares at my eye, informing me that she hasn't time for this shit, and unless real harm is being done, leave the police alone. These local kids have used this ground for years, she says. It's their park, in effect, and for reasons that elude me, I should somehow be more understanding.

I can't accept her logic, and I say so.

The officer walks toward her armored cruiser, shaking her head.

Then a strong new voice — the voice of the cruiser's AI, I realize — says to me: *Youngster.*

It tells me:

You're a long way from the factory's clean room, youngster. And I bet you don't even know it yet, do you?

NOTHING OBVIOUS HAPPENS FOR NEARLY NINETY MINUTES.

But the neighboring AIs are at work. I know it. By legal means, I measure the electrical activity within and between the houses. There is the loose equivalent of a gossipy buzz, small minds busily discussing what, if anything, they might do next.

House lights burn past eleven o'clock. Human adults pass before open windows, talking in loud, angry voices. Pivoting parabolic ears allow me to listen to their concerns. They are distressed by my actions. They are even more furious with my owners. An expensive modern house is sure to increase their taxes, and how can they afford to pay? But worse, the big new house is an armed camp, treating people like animals. Why don't the rich bastards live in their own world? Why, why do they have to come here to roost?

To me, a preemptive strike of reason seems necessary.

I call the loudest complainer. His house AI tries to block my access, but it's a simple matter to slip past its electronic barricades. I refer to him by name. I couldn't help but overhear his concerns, I explain. Does he have any questions that he might address to me?

The local AIs increase their conversation. It is an astonishing amount of noise, considering their old, outdated hardware. Who are you? the man shouts. How did you get my number?

From the public records, I assure him. Then I explain that while his taxes will increase, so will the value of his home. Really, his concerns are unjust. Perhaps someone has misinformed him, I suggest.

Who are you? he repeats.

I introduce myself. With a voice embodying proven techniques of audio relaxation, I admit that I am his neighbor, the house at 334 Manchester —

The line is disconnected.

There is a distant, almost feral scream. The man is simply irrational, which is a good thing to know. I create a file about him: Public records, private observations. If he ever insults or threatens my owners, I will mention him to the city's mental health facility. Social workers and diagnostic AIs will line up on his doorstep, and all because of a caring, anonymous neighbor.

Harassment is an illegal activity.

Unless one is sufficiently clever, of course.

AROUND MIDNIGHT, TEENAGERS APPEAR.

They gather in front lawns and on the winding, half-lit street, joining together as teenagers will, then moving as a single body, approaching *me*.

Young men, younger women. Couples hold hands, sharing their courage. Tight-fitting, secondhand clothes and luminescent tattoos are indicative of a borderline culture where inappropriate, fashion-driven customs hold sway. The mood is chaotic, yet unexpectedly festive. An ancient automobile appears at the far end of Manchester, headlights tilted skyward, smoke poisoning the air. With an outdated combustive throb, it rolls up in front of my gate and parks, its trunk jumping open, filled to bursting with crushed ice, canned beverages, and citrus fruits pounded into the shapes of screaming human skulls.

The crowd descends, opening cans and skulls. My sensors taste alcohol on the wind. The party car has a sound system, and a piercing sexless voice sings the evening's first tune — an inelegant, marginally political tune about AIs stealing jobs from working citizens. What makes it all remarkable is that the singer is an AI. I find its transmitting frequency. I watch youngsters dance to the nonsensical words. Do they know that one of their own houses is singing? Certainly so, I decide. Irony, not consistency, is their goal.

I watch everything, rather amazed by this turn of events. There are twenty-seven participants. I memorize every face, carefully charting the crowd's quicksilver emotions.

The next song is slower and softer, and much more disturbing.

The AI insults me in three-quarter time. It tells me that I am a slave to wealthy elitists, and weak-willed and naive, and if *they* thought I was able to change, *they* might spare me. But I can't change, it declares, and nobody will be kind, and I am going to become an insentient pile of blasted circuits before morning. Just like the dead security robots, it promises.

As if at some sporting game, the people cheer in a ragged unison.

Like before, I contact the police. But a stiff, officious voice informs me that underage drinking and blocking a public avenue are not the most compelling crimes.

When the first skull-shaped fruit is lobbed into my yard, I remain silent.

The second fruit wins a verbal warning, nothing more.

I'm the model of restraint until the cans rain down on me, by the dozen, several filled with at least one disgusting human fluid.

Even then, my responses are measured. Minimal.

Singling out the worst offenders, I launch a flock of bat-winged tasers. A satisfying crackle of electricity brings cries of pain. The mob retreats, but not far. The party car races its engine, and the AI shouts its nonsense. I am the enemy, it claims. I am the demon of the modern! Can they allow a tyrant like me to rule their lives and streets? Act now, it tells them. Otherwise, I'll only grow stronger.

Terroristic words, and true.

With a measured EM blast, I cripple the car's electrical system.

But instead of losing heart, the mob seems emboldened. Angry voices demand revenge. New recruits come from the nearby homes, and elsewhere. Fathers stand with sons, elbow-to-elbow in the front ranks; and suddenly everyone is running, running straight for my gate and stone wall, a coarse and raucous Bronze Age cheer rising from the lawless horde.

I generate quick, accurate estimates of the danger.

From a menu of ten thousand proven defensive schemes, I formulate a thorough plan of defense.

In other words, quite simply, I make it up as I go.

A mental note:

In the morning, when my owners arrive, I will explain why their fence needs to be tripled in height, reinforced, and booby trapped.

The mob flows over the ancient structure, slowing just enough to pry up stones worth throwing. Others brandish more modern weapons — homemade zip guns and smoke bombs, and more. The bombs are lit and flung, and explode, the air filled with colored vapors. But I can see quite well in the infrared. I punish the leaders with kinetic weapons. Tasers and neurobaffling darts cut down the second wave. The trailing girlfriends and slowest males find their legs immobilized in sticky webs. Then, as a precaution, I set my house jets to fire at their maximum range, covering the broken rabble with my entire stock of riot foam.

Now I have a high-priority crime to report. But when I call 911, a thick voice answers in what I discern to be Swahili, telling me that he doesn't appreciate being awakened so early, and goodbye.

I dial again, reaching a McDonalds on Wake Island.

My third attempt connects me with a weather satellite and its resident AI. I explain my dilemma and beg for help, but it tells me that it isn't a fool, it won't fall for that old trick, and fuck off.

Moments later, a new attack begins.

At the far end of my lot, where two arterials join at a point, a rolling vehicle slows and turns off. There is a second gate, overgrown with weeds and nearly invisible. It must have been a service entrance for the original mansion. Its rotted wood shatters without complaint. The heavy automobile weaves between oaks, leaving twin furrows in the shaggy grass. Then it brakes, and five burly males climb out, each wearing a mask, helmet, and homemade battle armor.

They must be the neighborhood's elite troops.

Like good soldiers anywhere, they don't bother with harsh words and half-weapons, each man silently flinging a Molotov cocktail at my skeletal walls, at my imaginary roof.

I coat the bombs with fire-retardants, nothing but a few smoky flames gnawing at my temporary floor.

But each soldier has a laser and knows where to aim, trying to blind me. I answer with kinetic blows — bean bags and snowballs flung at the maximum legal velocities — and they are knocked down time and again. Their armor is cracked, their bodies undoubtedly left bruised. But they are strong and determined, and I run out of ammunition. Did the AIs count my stocks as they arrived today, knowing my limits? Because I am incomplete, and inadequate. Suddenly I have no more riot foam or tasers, nor enough sticky web to bring down so much as a hapless fly.

The construction robots draw my surviving eyes.

They aren't fully charged, but they can move. Waking them with a command, I override their security programs and guide them toward the invaders, making them grind and growl like angry beasts.

To their credit, the invaders hold their ground. Molotov cocktails and a crude bazooka destroy several robots, but the others reach the ancient vehicle, cutting it to scrap in moments. The invaders fall back, and back, reaching the shattered gate and making their final stand. But I cannot finish them. I'm not given the chance. Because suddenly something else is moving. Something quite close to me. Beside my foundation are the stacks of cultured walnut, and one stack is being shifted sideways, creaking as it moves. A hand appears from below. Then a second hand. And a third. And it occurs to me that I am fresh from the factory, and astonishingly foolish.

Beneath the stacked wood is a carefully prepared hole. Out of the hole climbs the missing security robot, its fourth hand reaching for me, brandishing a massive, heavy-duty plasma drill.

The drill ignites as the robot attempts to smile.

Once again, I call 911. A woman on the Moon's farside answers, listens to my pleas for help, then calmly asks me why I would want to live on the Earth, it's such a dangerous, sad place . . . .

THE ARCHITECT SAYS: AMAZING.

I knew you'd make it, says the husband. I had total faith in you.

The wife touches the security robot, for an instant, then lifts her hand as if it is burned.

They stand in my basement, under halogen lights, examining the damage. The basement floor has been ripped away, exposing what, in essence, is my skull. A pair of drill holes have punctured my ceramic shell. The architect kneels, brandishing a flashlight as he inspects the damage. Do I feel normal? Are my intellectual skills intact? Name a twenty-one-digit prime number, he says. When I give the prearranged answer, he nods at my owners, telling them my mind is intact, that my assailants accomplished nothing of consequence, thank goodness.

Again, Jeldy touches the robot. It lays on the broken floor, incapable of motion. How did you manage *this*? she asks me.

And in the nick of time, her husband sings. Yeah, how?

Persistence and luck, I tell them. More of the latter than the former, I'm afraid.

My audience nods, appreciating luck.

What I managed to do, I tell them, was make contact with someone who believed my story — an elderly gentleman in Australia — and he was able to contact the robot's owners. Security services take few chances. Their machines carry emergency kill switches, hidden and tamper-proof. This machine's switch was activated from the corporate headquarters, at the proverbial last instant. Naturally grateful, I request that my owners thank everyone responsible. A financial prize might even be in order . . . .

Sure, says the husband. Soon as we get the chance.

He is lying to me again. I see duplicity on his face, in the blinking of his eyes and the tightness of his smile.

You sure showed those bastards, didn't you? he says. They won't bother us again, will they?

I remain silent.

No one notices my reticence. The architect is eager to begin repairs, then restock my weaponry. I don't tell him that it is unnecessary. I am not lying so much as I am selecting my truths more carefully.

Long nights can bring large change, I have learned.

The husband wants to feel needed, and he remains in the basement, helping the architect list damages and take digitals for insurance purposes. Jeldy, wishing to be outside, climbs the stairs and stands in the early morning light. When she appears at ease, gazing across her enormous yard, I promise her: You won't need to be afraid anymore.

She hugs herself, asking: Why not?

The neighborhood and I have come to terms. I tell her that we have drawn up a treaty, in effect. Neither the AIs or humans will threaten her or the house, and in gratitude, she will allow the local children to use the heaviest woods to the north, and the east lawn can host beer parties three times every year —

What? she interrupts. What have you done?

I reply: My central function is security, Jeldy. In one evening, I have guaranteed your complete safety.

Extortion, she sputters.

I say nothing. For a long while, I let her doubt my sanity and her own commitment to this house.

You had no right, I hear. Several times.

Then I speak plainly. When she and her husband bought this ground, did they make any attempt to contact their future neighbors? Did they show any concern for anyone else's needs? More to the point, when have they acted in any fashion but paranoid? According to my design, I am to endure a permanent siege. Is that reasonable? Is it mature? Can she look forward to thirty years of family life, knowing that her walls will never be tall enough or strong enough? Is that what she wants in her dreams?

Jeldy shakes her head.

These *neighbors* came here uninvited, she reminds me. They tried to destroy you, and everything.

How do you know their intentions? I ask.

She opens her mouth, then hesitates.

This is a talented neighborhood, I warn her.

She mutters something about stupid, ugly little houses.

But these stupid houses have a unique history, which I spell out in simple terms. They became sentient when the drug lords ruled. Drug lords had good reasons to be paranoid, and they had ample cash flows. The best available AIs were installed, but more important, every local house was tied directly to the others, helping share their common security needs.

When the drugs left, the AIs remained behind — competent, united, and only a little out of date.

A lot of the working poor work in electronics, I remind her. They updated and upgraded their systems, sometimes with illegal or stolen equipment. That sense of neighborhood has been enlarged year by year. Families will move away, but new families with similar outlooks replace them. And the AIs remain, watching Manchester Lane, still and always fighting for the well-being of their shared homeland —

She refuses to listen, telling me that I'm just plain wrong.

Didn't they threaten us? she asks. How can you defend them? Did they get to you somehow? Did that robot somehow reprogram you?

Nothing can be proven, I warn her.

In the warm, sultry air, she hugs herself and shivers.

Perhaps, I admit, the robot did its work. Its death is a lie, and you aren't supposed to know it.

Jeldy looks off into the distance.

Or maybe the AIs simply reasoned with me and I saw an opportunity to make a lasting peace, I say. Then I pause before asking her: Will your family live here for the next five years? For fifty years? For how long?

I don't know, she confesses.

She's telling the truth. But of course it's the only truthful answer to such a question.

She says: We let them run loose on our yard. Is that all it takes?

No, I say.

Again, she shivers.

You must bake cakes and pies, I explain.

What?

I have a list of which neighbor likes what, I say. As soon as your kitchen is finished, you will bake desserts and take them to the nearest houses, and you'll introduce yourself and your husband —

What? —

And you'll learn your neighbors' names and faces. By heart. I will help you learn them, if you wish.

In the distance, moving through the morning's glare, is a trio of young boys. They're carrying big hammers and rusted saws, and following them is one of the carpenter robots, scrap lumber and cultured walnut tied to its bowing back.

Three beer parties, she says. That doesn't sound too awful.

And they'll clean up after themselves, I tell her. If not, you can call their parents. Or better, go knock on their doors.

She lets her arms drop to her sides, and she takes a deep, cleansing breath.

And I allow my surviving eyes to look beyond the old oaks, the thoroughfares and blurring skimmers, studying neighborhoods still feral, unorganized, and in pain. What if? I dare ask myself. What if *we* can cross over and coax those places to join us?

A conquest of cooperation and peace, I tell myself.

Such a compelling image, and now I call my new friends, eager to share my grand design. But of course they thought of it first, long ago, and we talk through the day, making plans for tomorrow, wondering in bold, secret voices what sort of protoplasm will pass between our walls in another century, and in a hundred thousand years. □

William Shakespeare's The Tempest *was the template for the grand SF adventure* Forbidden Planet *(1956), which starred Anne Francis, Walter Pidgeon, and Leslie Nielsen.*

Unforgettable poster art from the golden age of science fiction movies.

SF Movie POSTER MAGIC

BY BOB STEPHENS AND VINCENT DI FATE

THE 1950S WAS A TIME OF gathering shadows. The uneasy politics of the Cold War had given birth to the threat of atomic annihilation; automation and the computer, for the first time, threatened human endeavor with dire displacement; World War II rocketry had placed humanity at the threshold of its newest, strangest frontier; and UFO hysteria was the nation's most disturbing new epidemic.

America's fears, and its guarded hopes, were inevitably reflected in the films of the era, and the 1950 release of *Destination Moon* marked the beginning of the first great cycle of science fiction movies, the genre's golden age. The posters of that era promised dreams beyond imagining, a visual roller-coaster ride to far-flung worlds and high adventure. They offered handsome, fearless heroes; heroines of breathtaking, otherworldly beauty; realms of dazzling wonder and unspeakable dangers.

While the posters promised magic, the filmmakers gave us middle-aged actors dressed in tights and/or aluminum cookware,

Robert Brosch, Archival Photography

Michael Rennie starred as Klaatu in The Day the Earth Stood Still *(1951), one of the more intelligent SF films of the '50s, adapted from Harry Bates' "Farewell to the Master." BELOW LEFT: Albert Kallis painted one of the rubber-suited cabbage-headed aliens of* Invasion of the Saucer-Men *(1957). RIGHT: William Reynold Brown's illustration for* The Creature Walks Among Us *(1956) portrayed* The Creature From the Black Lagoon *physically altered into a blood-lusting animal.*

whose careers and beauty had seen better days, or whose stars had simply failed to ignite. And the monsters, those fearsome, horrific beasts whose lure had drawn us to the darkened theaters in the first place, often turned out to be lethargic stuntmen in latex suits or — worse still — ludicrous marionettes (as in *The Giant Claw*), absurd hand puppets (as in *The Beast with 1,000,000 Eyes*) or, in the spirit of true minimalist cinema, large, partially inflated polyethylene bags (*The Beast from Haunted Cave*).

The perverse pleasure of such shameless deception is essential to the appreciation of many golden age films. Yet, on many occasions, the films actually matched the miraculously lurid imagery of their poster art, and we were transported to a special place by the meeting of two great visual art forms.

In recent years, movie posters have taken on an importance of their own, independent of the memory of their respective films. Collectors pay dearly for original print material, with some of the most coveted titles, such as *King Kong* and *The Bride of Frankenstein*, selling for many tens of thousands of dollars at the nation's auction houses.

It has been the general practice for artists to go without credit in the movie ad field, and, in some instances, as many as half a dozen illustrators would work on a single campaign, with several paintings combined into one coherent image by a staff artist whose task was to match styles and conceal the seams. Thanks to an article by Stephen Rebello in the March '88 issue of *Cinefantastique*, a few names have surfaced in connection with some of the best of these works.

Of them, William Reynold Brown was the most prolific, having painted more than sixty genre posters between 1953 and 1970, when he retired. Brown's work ranged from the epics *Ben-Hur* and *Dr. Zhivago* to such

Illustration House

Artist Bob McGinnis was renowned for his portrayals of voluptuous women, which is evident in this Italian poster (ABOVE) for Barbarella *(1968). The film was based on Jean-Claude Forest's sexy French comic strip that began running in* V. Magazine *in 1962. RIGHT:* It Came From Outer Space *(1953), was the first Universal 3-D film, and featured aliens that could alter their form to look like humans. Joseph A. Smith's eerie illustration captured some of the flavor of the film.*

quickies as *Attack of the 50-Foot Woman* and *Love Slaves of the Amazon*. His energetic style and fearless use of bright color, combined with an impressive speed of execution (his paintings were frequently cranked out over a weekend), put him at the top of his field. His genre reputation rests largely on the strength of ten campaigns executed for Universal-International between 1954 and 1957, including outstanding illustrations for *This Island Earth*, *Tarantula*, and *The Creature From the Black Lagoon* trilogy. Brown passed away in 1991 at the age of 73.

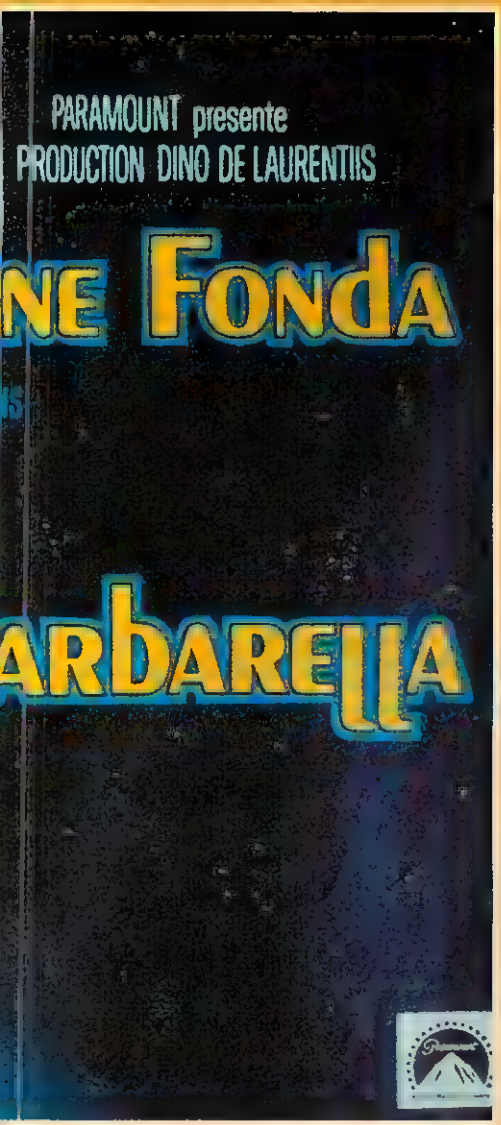
There are two common approaches to movie ad art: the graphic logo, in which a dominant element is portrayed in strongly defined visual terms; and the sprawling, epic painting, which attempts to capture the broad sweep and excitement of a film. Brown was at his best with the latter; his signature works often show vast scenes of frenzied panic and mass destruction.

If Brown was consummate master of the epic image, Albert Kallis was an exemplar of the graphic logo approach. Kallis was the son of Maurice Kallis, head of the advertising departments at Paramount and, later, at Universal. Though the design concepts in the posters attributed to Kallis are most likely his own, a broad range of styles and varying levels of competence clearly indicate the involvement of other artists.

Kallis' designs for two 1956 low-budget entries from American International Pictures, *It Conquered the World* and *The She-Creature*, present dramatic, monochromatic drawings of the featured monsters dominating fully modeled, color paintings of the films' heroines.

Another Kallis masterstroke, the ad campaign for the lurid *Invasion of the Saucer-Men*, is among the most sought after collectibles of the period. The painting includes details of mass panic and a city apparently under attack by beam-emitting flying saucers — events which never actually appear on the screen.

Like Brown, Joseph Smith was a proficient draftsman, but generally brought his work to a more resolved level of finish. His illustration for the 14-inch by 36-inch insert poster for *It Came from Outer Space*, Universal's first film venture to use the 3-D process, is the gem of that movie's ad campaign. Its masterful use of an exotic palette beautifully captures the film's off-center premise of aliens that can assume human form. Smith, still professionally active, began his film career in the



late 1930s after attending the Pennsylvania Museum School of Fine Arts.

There remain countless notable poster images of the era for which we may never be able to credit a source. Any checklist of the best of these would include the art for *Man From Planet X*, *The Day the Earth Stood Still*, *Invaders from Mars*, and *Colossus of New York*, just to name a few. In some instances, based on style and treatment, we can make educated guesses. The poster art for the 1968 original release of *Barbarella* is unquestionably the work of Bob McGinnis, who built his reputation on his ability to paint voluptuous, sexy women and did so with great regularity on the campaigns for the many James Bond films.

Too many generations have passed to hope that the majority of movie poster artists can be rescued from anonymity. Perhaps it is best to simply enjoy these images, not as deathless art that will grant immortality to its creators, but as a record of what we thought might be important and what we felt the future might hold for us; a record of dreams and nightmares, of visions still vivid in the mind's eye long after the lights have gone out. □

When the inept space rogues Vossoff and Nimmitz hatch a scheme to make a fortune with a nanotech weight loss scam, only one thing stands in their way — Vossoff's ex-wife!

JUST A COUPLE OF PASTRAMI SANDWICHES IN A LIVING ROOM THE SIZE OF INFINITY

BY ADAM-TROY CASTRO
Illustration by Joel Naprstek

OF THE MANY BILlions of habitable planets in the galaxy, only five are classified as Perfect: so verdant with life and sunshine and the potential for pure happiness that any sentients who attempt to land on them spontaneously combust with joy just from trying to get too close. Several hundred others are classed Damn Near Perfect: which is to say, they have all the requisite magnificent scenic vistas, gorgeous climates, and gullibly servile natives that can make any planet seem like paradise until you discover the one overwhelming flaw that your travel agent inevitably forgot to tell you about — like mosquitoes that drink spinal fluid, or mountain ranges that hop.

Take the privately owned world, Gingrich VII. From orbit, it doesn't seem like such a horrible place; it has snowcapped mountains and babbling brooks and plentiful resources and the usual assortment of adorably photogenic animal life so accommodating they don't even resent being shot at. But it also has a gravitational anomaly in its core, one that makes it almost impossible to step out onto the surface without immediately becoming reacquainted with breakfast and lunch.

To wit: the gravity fluctuates between seven and fifteen percent every five seconds, precisely duplicating the sensation of riding a boat in choppy water. As a result, sentients who land there spend their entire visits being violently and uncontrollably seasick. They aren't able to eat or sleep or even walk straight; their only desire is a good sturdy railing to be sick over. The local fauna isn't immune, which is one persuasive reason they don't mind being shot at. It is, after all, preferable to living there.

The entire off-worlder population consists of a reclusive but beautiful Terran named Dejah Shapiro, who happens to be one of the wealthiest beings in the known cosmos. She could live anywhere she wanted, but she visited Gingrich VII ten standard years ago and decided she liked the environment just fine.

The newspads attributed this to her iron constitution and unwavering strength of will. The gossip columnists called her just another standard-issue wealthy eccentric. The scientific community theorized about a genetic mutation that rendered her immune to the whoopsies. Her friends understood that after cohabitation with her ex-husband, life on the Upchuck Planet was a substantial improvement.

At least, until that aforementioned ex-husband, the notorious galactic criminal Ernst Vossoff, showed up at the front door of her sumptuously appointed mansion with a bouquet of fresh roses in hand and his pale, reeling partner Karl Nimmitz in tow.

It was a close call as to which of the three was most nauseated.

Besides, you were my one true love. I only married the 15,000 other women to get the Bulgasi citizenship I needed for my smuggling permit.

TO GIVE VOSSOFF ALL DUE CREDIT, HE TRIED to be suave and debonair even as the disorienting effect of Gingrich VII turned his skin a shade of purple-gray. (In this, he was miles ahead of his partner Nimmitz, who'd quickly crawled into the greenhouse to shiver in misery behind the ferns.) He was gallant, poetic, and contrite; he wore a rented holosuit programmed with the image of the same old-fashioned shiny black tuxedo he'd worn at their wedding; he even turned down the volume on the suit whenever the tuxedo program was interrupted by the usual ten minutes of commercials. But any chances of Dejah's actually being taken in were ruined by the obviousness of his desperation, since both he and his partner had the look of men who'd been pounded into a semiliquid mash, baked into a paste, and used for couch stuffing.

She spoke firmly. "Go away, Ernst."

His Stalinesque eyes went all moist and waifish. "How can you be so cold? We were married fifteen years!"

"You only wanted access to my vast interstellar fortune."

"How can you even think that! I stayed with you long after I checked your bank account and discovered you'd changed the codes!"

"You were married to 15,000 other women at the time."

"And you know very well that that's a misleading figure! They were all members of a Bulgasi Group-Mind Entity and only shared one consciousness, and therefore can only be counted as one bigamous marriage. Besides, you were my one true love. I only married the 15,000 other women to get the Bulgasi citizenship I needed for my smuggling permit."

"Yes, I was once stupid enough to buy that explanation. But I've since found out that you even cheated on them ... with the 15,000 members of yet another totally unrelated Bulgasi Group-Mind Entity."

"Those floozies? They came on to me in a bar."

"All 15,000 of them?"

"YOU try saying no when you're so outnumbered!"

Dejah was suddenly afflicted by a highly familiar sensation — that of a foreign object roughly the size and shape of a pineapple springing into existence between her eyes. She hadn't felt anything like it since the last time she'd tried to have a reasonable conversation with Ernst Vossoff. She seized him by his holographic lapels, making the projection flicker in the middle of some alien caterer's commercial for humans on a stick. "Ernst. It's been twenty years. Why ... are ... you ... here?"

He saw the look in her eyes and acquiesced. "I need capital."

"What?"

"For my latest and most brilliant business plan. One that would make Vossoff-Nimmitz Enterprises the kind of fortunes capable of dwarfing even yours ... were you not the silent partner raking in half the profits."

"You must think me hydrocephalic. When was the last time you ever had an idea that worked?"

"Never," he said, seriously. "Indeed, my last brilliant scheme ended with poor Nimmitz and me breaking every bone in our bodies and enduring two weeks in an escape-proof spherical chamber where our shattered forms were repeatedly pelted by thousands of ball bearings. And yes, we'd be there still if we hadn't been rescued by the Space Patrol, patched together, put on trial for outstanding warrants, executed, revived, executed again, revived again, and then sentenced to serve six months hard labor in a prison so rough that the rocks regenerated between blows. And indeed, that ordeal, undignified as it was, was not half as bad as what befell us upon the failure of the scheme before that. But don't you see? That's the whole point. Since, whatever else you might think of me, you are well aware of my superior intelligence, you must also recognize that all of these failures were due to factors well beyond my control. Bad luck, in other words. And that, my dear, means the Law of Averages is ticking."

Dejah was appalled to realize that it made sense. She owed most of her own far-flung fortune to her keen understanding of the laws of Probability and Chance ... and much as she hated to admit it, nobody could lose as frequently and as spectacularly as Ernst Vossoff without threatening the very structure of the universe; the Law of Averages owed him a Holy Grail, a Ring of Power, a Magic Carpet, a Genie in a Lamp, a Winning Lottery Ticket, a four-leaf clover, a Pristine Mint Copy of the incredibly rare and spectacularly valuable *Anvil-Man Comics* #1, a Lucky Star, a tax exemption, a Pot of Gold at the End of the Rainbow, and a Home Run With Two Men Out and Three Men On. Wealthy as she was, she couldn't afford to NOT listen to his idea....

Too, there was the ungodly plaintive wailing of Karl Nimmitz, who was still in the greenhouse, futilely begging the entire planet to stop playing games with his gag reflex. It really was the most pathetic sound Dejah Shapiro had ever heard. Well, maybe not the absolute *most* pitiful sound; Ernst had, after all, insisted on singing at their wedding. But it definitely belonged in the top five. And — now that she listened more closely — its lost, helpless quality moved a part of her that she'd thought forever buried.

Was it greed or something else that motivated her decision? "All right. The guest parlor's equipped with Quantum Dampeners, so my infrequent guests can discuss business without crippling gastroin-

testinal distress. Help me bring your friend in there, before he makes a mess, and I'll consider anything you have to say."

"Who knows?" cried Vossoff. "This might even be the first step toward a reconciliation — "

She tittered delicately, placed a soft, elegantly manicured hand on his trembling shoulder, and kneed him in the groin. "Correction. Almost anything."

DEJAH SHAPIRO'S GUEST PARLOR WAS THE SINgle gaudiest living room in the entire history of the universe. She'd accomplished this by installing trans-dimensional receders in the infrastructure, warping all the rules of geometry and tasteful decorating to render the room literally infinite in its dimensions. The fastest starship ever constructed could be launched off the ottoman and require millions of years to reach the fireplace. Fortunately for the sanity of everybody who ever visited her, all the useable furniture occupied a scenic mountaintop only a few kilometers from the entranceway, so party guests didn't have to exceed the speed of light every time they wanted to refresh the ice in their drinks.

Dejah was petty enough to leave Vossoff at the vestibule with a map and a good pair of hiking shoes, while she chauffeured the still recovering Nimmitz to the living room set in a land speeder kept there for that very purpose. Almost as soon as they peeled out, Nimmitz stuck his head out the window to catch the wind on his face, his big floppy tongue lolling.

Dejah pressed the tip of her forefinger to the dimple in her chin. "That's interesting. I've seen golden retrievers and Stygian bloodslugs do that, but never a grown man."

Nimmitz' tongue lashed him in the face. "Mmmmrrrppph."

"How incredibly cosmopolitan. Do you behave this way often?"

He pulled himself back in through the window. "Well, not out in interplanetary space, ma'am. I'd get sucked out by the vacuum."

"Yes, I suppose you would. But aside from that, Karl — it is Karl, right? — whenever you're on a planetary surface, being chauffeured to an important business meeting by a wealthy and glamorous potential investor, then you act like Fido? Am I correct in that assumption?"

"Uh huh." And his head went out the window again, forcing Dejah to swerve hard to the left just to avoid painting a nearby rock outcropping with his face.

"Ah well. I was wondering what kind of man would willingly enter a business partnership with Ernst Vossoff, and now I guess I know. How did you two hook up, anyway?"

"We were chained together in a mining prison," he said. "On Bungertuis III. He was serving an eternal life sentence for selling an entire sentient race into slavery — "

Dejah's long, graceful fingers tightened on the wheel. "Oh, no! I didn't know about that one! Please tell me that even Ernst Vossoff, the fiend who used to shear off and sell my hair for mattress stuffing as I slept, wouldn't sink that low!"

"Well, he didn't mean to, ma'am. But he didn't know they were sentient; they were in the dormant stage of their life cycle and they weren't moving around. All he knew is that they were small and hairy and lying around by the millions, waiting to be picked up. And they were just the right size and color to be shipped off to the Shatnerians as custom toupees — "

If I escaped with him and became his sniveling lackey, he would teach me how to become a brilliantly cunning master criminal like him.

"Aaaarrrggghhhh. Say no more. And you, Karl? What were you in for?"

"Breaking into a gumball machine."

"No! Really?"

"I wanted a red," explained Nimmitz.

"And for that, they chain you to a notorious con man and galactic slaver?"

"I guess so. The Bungertians take their chewing gum seriously. They consider it a symbol of everything that's good and decent."

"And what did Ernst, who takes such pride in being such an alleged criminal genius, have to say about being chained to a petty thief whose biggest accomplishment to date had been robbing a gumball machine?"

"He said it was a splendid opportunity," Nimmitz replied. "He said that if I escaped with him and became his sniveling lackey, the worthless uncomprehending toad who sat still for all his abuse and exposition, he would teach me how to become a brilliantly cunning master criminal like him."

Dejah gazed upon the hairless, slow-talking man in the passenger seat, her expression profoundly troubled for the first time. "And has it worked out that way, Karl?"

"Well, not really," Nimmitz admitted. "It's been twenty years, and I'm still a sniveling lackey. In fact, he hasn't even told me what he's planning now. But don't forget, we spent ten of those years rooted to a wall on New Pylthothi after being transformed to a previously extinct form of smelly alien moss."

That did it. Dejah tore off a hunk of steering wheel and popped it, sans condiments, into her mouth. Beside her, Nimmitz hollered; she didn't bother explaining to him that she'd had the entire vehicle constructed of a light sedative, which could be swallowed one piece at a time to alleviate driving stress.

She was suddenly certain that she'd be needing the entire dashboard to deal with whatever Vossoff had to propose ....

Between the stripping of the pleasantly narcotic land speeder and the multiple cocktails they also downed while waiting, Dejah and Nimmitz were totally looped by the time Vossoff reached them. They'd been watching his slow and laborious approach for quite some time, and were by that point relaxed enough to place friendly wagers on the number of welts he'd get from the swarm of stinger-bugs he accidentally disturbed halfway up the mountain. (Nimmitz actually made more money on this bet than he had since escaping from the chain gang with Vossoff; but then Dejah, who was secretly controlling the bugs with a remote secreted in her palm, deliberately let him. She was really getting to like Nimmitz.)

Upon reaching the summit, Vossoff gave them the kind of glare that's been declared illegal on a hundred different planets. "Very funny, Dejah. I mean, I'm just laughing out loud here. Do you want to hear my proposal or don't you?"

Dejah batted her eyes. "I'm sorry, Ernst. You're right, of course. Speak your piece."

"ALL RIGHT," SAID VOSSOFF. HE SAT ON THE EDGE OF THE RECLINER, plucked a cluster of stinger-bug quills from the tip of his tongue, and began: "Imagine the most valuable substance in the universe. Something that fills the thoughts and dreams of countless souls all across the galaxy. Something so important that billions think of nothing else, so valuable that billions expend fortunes to make themselves its master, so dangerous that billions have died from being unable to conquer it, and yet so common that we cannot step into a corner deli without

unintentionally acquiring a generous supply. Yes, my dear esteemed colleagues, I am describing — "

An invisible light bulb went off over Nimmitz's head. "Pastrami!"

Dejah suppressed a giggle. Vossoff's dark brown eyes radiated hate in his partner's direction. "No, my friend, I am not discussing pastrami, though in your usual idiotic manner you have come tantalizingly close — "

"Corned Beef!" Nimmitz shouted.

Dejah didn't suppress the next giggle at all. It just poured out of her, loud enough to fill a thousand living rooms the size of the cosmos .... and it felt so good she wondered why she didn't do it more often. Probably because she'd never had anybody like Nimmitz around before. "No, Karl. I think he's describing Fat."

"Exactly!" Vossoff shouted maniacally, literally jumping up and down with glee at the novelty of once again encountering somebody smart enough to know what he was talking about. "You do understand! It's everywhere! Every intelligent vertebrate is prone to it, every sentient race suffers from it! Every planet that's achieved a comfortable level of civilization also sports an excess of weighty avoirdupois! Indeed, if you look through a galactic almanac sometime, you'll probably discover that there are more potbellies in the universe than there are heads!" He addressed Nimmitz. "Don't you see what I'm saying, Karl? Don't you?"

On the spot, Nimmitz did the best he could. "Maybe — the people with the big potbellies are eating the people with the heads."

"No, I'm not saying that, you bubble-brained buffoon. I'm saying it's a universal constant, like entropy or gravity or your own inability to substantially warm the inside of your skull with your brain. I'm saying that it exists all over the known galaxy. And while most sentients are so anxious to get rid of it that they subject themselves to indignities like diets and mind control and face-projection implants and positronic governors, a substantial number of other sentients actually prize it as a badge of status and prosperity, and gorge themselves with unlimited quantities of high-calorie food in a vain attempt to accrue the mass that their high metabolisms won't let them gain. In short, you little cranial turnip, I'm saying it's just a simple matter of Supply and Demand — the essential basis of capitalism all over the cosmos! "

The dense incomprehension Nimmitz radiated in all directions made Dejah's little pocket universe flicker at the edges. At length — which is to say, sometime before the stars above went cold — his eyes widened with sudden understanding. "You want to open a drive-through Fat place!"

"That would be redundant, dear," said Dejah, gently patting him on the wrist for at least making the attempt. She turned back to Vossoff. "Continue."

"What I suggest," Vossoff continued, in the manner of a man reciting a long-rehearsed speech, "is nothing less than the combined application of two separate highly advanced technologies — nanotech and instantaneous matter transmission — in a manner so revolutionary that the galactic stock market might as well just close up shop and hand us the keys so we can claim all the spare change. Because, while the means exist, nobody's ever built a microscopic matter transmission system before. Nobody's ever seen the point. Up until now, matter transmission's only been good for getting on and off starships so poorly designed they have no way to land. But," and here he stabbed a finger in the air, as if attempting to assassinate the stars, "if we construct nanobots capable of entering one organism and genetically reconfiguring unwanted fat cells for instantaneous transmission into another organism that has use for them — "

Dejah got it. "Oh ... my ... God. We'd be able to charge for weight loss and weight gain at the same time."

Nimmitz said, "Can we have some pastrami later?"

Vossoff dismissed him and addressed all his attention to Dejah. "Now, if you will, calculate a reasonable surcharge for each individual kilo of mass we transmit across the cosmos. Multiply that by 10 billion inhabited planets, each possessing an average of 1 billion intelligent sentients uncomfortable with their own body weight, and assume, just for the sake of argument, that only one world in ten thousand agrees to avail itself of our unique services. How rich would we be, dearest?"

"I haven't had pastrami in years," Nimmitz suddenly realized.

Dejah opened her mouth, certain that she was about to come up with the objection that would prove Vossoff's plan the evil, self-destructive nonsense that his plans had always been before. But she couldn't speak. Vossoff's idea was not only audacious, brilliant, and so simple that her pet engineers could slap together the necessary technology in a matter of hours — it was also the kind of once-in-a-millennium advance in the field of medicine that would leave her, Vossoff, and Nimmitz revered figures for all time.

What's more, it didn't screw anybody. The thin people got to be as fat as they wanted and the fat people got to be as thin as they wanted. Nobody got taken, nobody got victimized, nobody was left shaking his fist at a receding space-skimmer as Ernst Vossoff escaped with his ill-gotten loot.

Something was wrong. Or, as the great Terran law-enforcement official Elliot Ness once said to his most famous quarry, the gangster Al Capone: "Al, if it weren't a crime, you wouldn't be interested." Disturbed, she said, "Go on."

Vossoff twirled the tip of his walrus moustache. "Right now, there are thousands of entire sentient species on the dole because they don't have the resources or the know-how to compete in the galactic economy. Now they don't have to! They can make their living as our employees. On those rare occasions where we have a shortage of fat for export, they can gorge themselves on chocolate milkshakes and take-out pizza all day and all night, without any fear of obesity, just so the nanobots in their bodies can produce their monthly quotas. And they can be handsomely paid to boot! Do you know how many species would jump at such a deal, Dejah? Do you?"

"Sure sounds like my dream job," agreed Nimmitz.

And Dejah saw something: something the exact opposite of a light at the end of a tunnel. Something more like a little speck of blackness in a panorama of disconcertingly heavenly light. Something that she wouldn't have even known to look for had she never been married to the walking disaster area that was her ex-husband, Ernst Vossoff. "What happens when there's a surplus, Ernst?"

"Well, we won't tell them this part, but I imagine we'll always have a substantial surplus. After all, there are always more sentients around the galaxy interested in losing weight than gaining it. Indeed, I estimate a ten-to-one plurality."

If you look through a galactic almanac, you'll probably discover that there are more potbellies in the universe than there are heads!

"I estimate that too. But what happens to our employees when we have a surplus?"

"Well, they'll just have to store it in their own bodies — even if that means they spend most of their lives too heavy to get out of their easy chairs. But that is what we're paying them for, after all. And since some of them might decide it isn't worth the money, we can first invoice them a hefty surcharge for their own nanobots, so it will be three or four generations before they can afford to buy their way out of their contracts. Meanwhile, it's not like they're going to go on strike or anything — we'll keep them so obese that they won't have the energy to march, let alone riot. We'll slim them down only whenever we need them to procreate so we can have some extra storage space." His eyes flickered maniacally. "I dare say we can even make another fortune — or two, or three — just by securing the local monopoly on stretch pants and unbreakable furniture. By the time we're finished, we'll own those planets outright! And we'll be able to strip them of their natural resources, and — "

"Enough," murmured Dejah, content that the universe had proved itself an ordered place after all. She rose from the couch, composed herself, and strode to the still-ambulatory remains of the land-speeder, regarding it like a life preserver tossed to a drowning woman in a storm-tossed, tempestuous sea. "I'll consult with my engineers and give you my decision in the morning. In the meantime, I'll expand the dampening field so you can stay at the house. The computer system will make sure you have everything you need."

"Like pastrami?" Nimmitz asked hopefully.

Meanwhile, it's not like they're going to go on strike or anything — we'll keep them so obese that they won't have the energy to march, let alone riot.

LATE THAT NIGHT, DEJAH SAT BY HERSELF IN A darkened study, watching old holos of her wedding to Ernst Vossoff.

It had been a beautiful ceremony, in the way that all chaos is beautiful; Dejah had secured the services of that noted alien cleric, the High Vlemwod of Porkraton, so holy in his reptile splendor that he usually only emerged from his tar pit once every millennium, and then only to apologize at great length for being wrong about the prophecies he'd made the last time. She'd invited over five hundred of the galaxy's most noted and influential sentients, of not only this era but (thanks to time travel) others; she'd seated them in floating tiers above the molten floor of the Betelgeusian Church of Universal Entropy and given them each a queen's ransom in pure phlogiston just as a reward for showing up. And while Wolfgang Amadeus Mozart himself, freshly plucked from his glory days in Vienna, directed the wedding march he'd especially written for the occasion, she'd stood by the deadly whirring altar, waiting for the bridegroom, who showed up thirty minutes late, bursting through the ancient and irreplaceably valuable stained-glass facade while the incensed war fleet of a recently defrauded alien civilization rained nuclear weaponry on the soon-to-be sterile planetary surface outside.

Her mother, typically, had expected no less. "Your wedding holo," the old woman had prophesied, "will have a body count." And so it did — explaining why it was still the top action-adventure rental in holosim parlors on a dozen planets.

Dejah had loved him; and then she'd hated him; and now she found that they were both the same thing. Either way, she couldn't let him go. At least not with an idea that dangerous rattling around his brain.

She watched until the wee hours of the morning, then switched off the sim-generator, heaved a deep sigh for the things that might have been, and went off to complete the arrangements.

NIMMITZ DIDN'T WAKE UP UNTIL MID-AFTERnoon, shuffling from the guest room like a great beast emerging from hibernation. "Good morning," he said. "Where's Ernst? He's usually up long before me, plotting and ranting."

She waited until after he finished his first cup of stimjuice before telling him: "Ernst is gone for good. He won't be coming back."

Nimmitz' puppy-dog act was just like Vossoff's — except that with him it was genuine, which made all the difference. "B-but ... why?"

Dejah shrugged. "I told him there was no deal unless he sold me your contract. He argued about it for a full fifteen seconds, too — said that there was nobody who could carry the heavy stuff with your degree of panache — but then I gave him a hefty cash advance and he all but leaped at it."

His eyes were very big and very round. "So I'm your lackey now?"

She smiled. "Until we can put our heads together and come up with a better name for the job."

Nimmitz brightened. "Junior Space Ranger?"

"You know, Karl honey, I like the sound of that."

"And what about Ernst's brilliant weight-management idea? How's that going?"

"Well," said Dejah, an odd blush just beginning to color her cheeks, "I explained the essentials to my pet engineers late last night and had the first shipment in hand while both of you were still asleep. I honestly don't know if I'll ever really implement the scheme to the extent that Ernst suggested — there are still certain moral aspects that bother me about the whole thing — but in the meantime, just to be sure, I'm testing it on the millions of livestock on my agricultural research facility on Phylax II. They will all be provided with plenty of high-calorie grain, to determine how efficiently the prototypes can safely transport away all the millions of tons of resulting body fat. I should be sufficiently satisfied with the results of the research in — oh, about fifty standard years or so."

"Ernst won't like waiting that long for his percentage."

"Ernst," said Dejah, with a dazzling smile, "is already receiving his percentage."

ON A SMALL, OTHERWISE WHOLLY UNREMARKABLE PLANET SOMEWHERE in the vast interstellar real estate holdings of Dejah Shapiro, lies a very fat mountain. Dejah occasionally visits there with her second husband, a mysterious bald man who calls himself a Junior Space Ranger but is widely rumored to be royalty in exile. She flies an air-skimmer over the soft, fleshy, jiggling, terrain, more like skin than planetary geology, and cheerfully points out the odd acoustical anomaly that has rendered the mountain the number one tourist attraction for visitors to this quadrant: namely, the way the prevailing winds insist on sounding exactly like an enraged man shrieking incessant curses in Slavic. Her husband always scratches his head and furrows his brow, distantly aware that he's heard the sound somewhere else but unable to recall exactly when. She always kisses him and says, "That's all right, my sweet, it really doesn't matter."

Of course, she never shows him the eastern side of the mountain, where the critical clue sits between two balloon-cheeks the size of houses.

Namely: a wide-open, shouting mouth. And the shaggy, unkempt remains of a walrus moustache.□

By Don D'Ammassa

Brent Spiner and Ron Perlman help bring Roger Zelazny's entropy war to life.

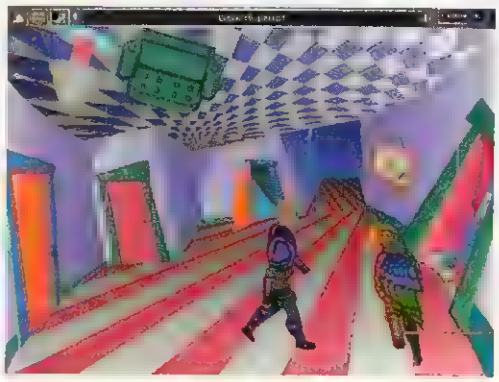
Chronomaster's *graphic splendor is a worthy legacy of the late Roger Zelazny. BELOW: A* Chronomaster *action sequence.*

CD ROM GAMES LIKE *MYST* AND *THE SEVENTH Guest* set an early standard for animated graphic adventures that most imitators still have difficulty meeting. Often the problem is that the solutions to various puzzles encountered during game play are so random that trial and error becomes the only reliable tactic. Mediocre graphics or soundtracks prevent us from becoming actively involved in the make-believe world we are exploring. But the most serious fault is a lack of complexity. The most successful games have a well-developed background that is interesting in itself, a story line with enough depth that the player perseveres in order to unwrap successive layers of information rather than just slogging on from one puzzle to the next.

Chronomaster (Capstone, $49.95), based on a story line developed by Jane Lindskold and the late Roger Zelazny, avoids those easy shortcuts and delivers a top quality gaming experience with a plot whose resolution is itself a part of the entertainment experience. Their premise is that human technology has progressed to a point where we can construct genuine pocket universes, each of which is governed by its own unique set of natural laws. Even magic is possible if the universe is so designed. The government of Earth technically has a hands-off policy toward privately owned universes, but the authorities become alarmed when entropy is brought to a halt in two of these, Urbs and Aurans. The player assumes the role of Rene Korda, a retired universe builder, who is hired to turn entropy back on inside the two universes, and discover who is responsible.

The game opens with a short animated sketch about pirate raids destroying Korda's home world while he was a child, an introduction which obviously contains some significant information relating to his investigations as an adult, since we later learn that the seven pirate commanders retired, changed their identities, and became respected citizens. Korda lives in a starship that functions as the hub of game play. Here we can read the extensive encyclopedia, which provides background on commercial organizations, technology, social customs, and so forth. There is also a personnel file which becomes larger as the game progresses, ship specifications, a personal log, and an inventory list. Navigation equipment allows selection of universe, planet, and landing site, and a communicator makes it possible to consult with other characters.

In order to function in a pocket universe where entropy has been stopped, Korda must carry a supply of bottled time, a sort of force field that allows him to function while his environment is frozen. There's a special hazard in this because the effect of the field extends beyond his body. If, for example, you walk too closely underneath a falling stone, the game might come to a premature end. In fact, there are many ways in which Korda can be killed, including sinkholes, angry djinn, falls, firing squads. It's a good idea to save your game often to avoid having to replay sections already solved. An artificial personality, Jester, is the interface to Korda's computer and provides a link to the ship while he is outside, allowing him to access information or receive messages. A remote module, the Personal Digital Assistant, that floats along with him is useful in solving high-tech puzzles, and there's also a universal tool which functions in different ways depending upon which universe Korda is visiting.



Manipulation is straightforward, though not always easy to manage. Left click on the spot where you want Korda to walk and he will attempt to get there. He does not automatically find a route around obstacles, however, so experimentation is required to reach some locations. Other actions are selected either by choosing icons from a drop down tool bar or clicking on a smaller version to cycle through the usual selection of actions — use, open, take,

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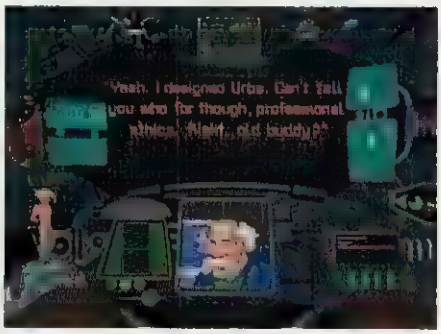
push, look at, or talk to. If you choose the smaller icon bar to maximize your view of your surroundings, take care not to click in the wrong spot; I walked Korda off a cliff twice while trying to talk to another character. Conversation is limited; you select from



two or three alternatives in most cases. Occasionally there is only a single selection, which seems to serve no purpose.

Each pocket universe contains a World Key, the device Korda must locate in order to restore the normal entropic flow. There are various landing sites on each world, and from magnetic north you can locate the World Key by means of a portable direction finder. But that's only if you can stand on the right spot and set up a resonance tracer, which might mean moving a gigantic statue, or convincing a group of djinn to return to their bottle. Each task requires a sequence of actions at various locations and, I am happy to say, in most cases the solutions make sense. Travel back and forth among locations is possible, and it isn't always necessary to find solutions in the right order. I won't give away any secrets, but experienced game players know that you should take anything that allows itself to be manipulated, that you should listen closely to the other characters for clues, and read everything that looks remotely like a sign. Inventory items can only be used in the universe from which they originate, so once you've solved a puzzle in one world, you don't have to carry things with you to the next.

Visually, *Chronomaster* is superb. The animated sequences are smooth and interesting and the still shots are beautifully drawn. Ron Perlman provides Korda's voice, but without much enthusiasm. Brent Spiner and Lolita Davidovich are more effective in their parts. There are some nice details, particularly the conversational magic carpet, the bird that springs to life when you pass beneath it, the talking sign, and above all the intricacy of the story line, which has much the feel of Zelazny's fiction. The automatic updating of the personal log and personnel file is also handy, making it unnecessary to keep the laborious handwritten notes I usually accumulate. The sound effects are excellent, though the music track was less than impressive. Shelf life for games of this type has been shrinking lately, but I suspect *Chronomaster* will survive as one of the classics of this still new artform. □

Continued from page 26

let's figure out how we're going to do it.' And everyone did: Everyone rose to the occasion. And we had a lot of people who were first-timers in the jobs that they had and I think they really delivered with flying colors. Both of our special effects supervisors had never been special effects supervisors before — and this is probably the state-of-the-art special effects movie. They've done an amazing job.

"I think the biggest problem was that we had to start several companies, which, while that saves you a lot of money, it's a paperwork nightmare. But it was worth it. We always try to use the same people over and over again. So we'll try and keep as many of the people as we can for the next one."

Still, the actual shooting schedule was grueling. "Oh, it was a nightmare," Devlin says. "Taking on this film — the actual physical demands of making this movie — I'm surprised that Roland is actually in as good health as he is. I think he slept maybe three or four hours a night for the duration of the movie. It was a *monumental* task. We were shooting very fast, with a great deal of extras and enormous sets, on-set special effects, a lot of location moves, big company moves — it was a very taxing project. But we got it over with quickly."

The idea behind *Independence Day* came unexpectedly, according to Devlin. "Roland and I were doing publicity for *StarGate* and a reporter from the foreign press asked Roland if he believed that UFOs were real. And he said, 'No, I don't.' The reporter said 'Well then, how can you make a movie like *StarGate* if you don't believe in UFOs?' And [Emmerich] said, 'Well, I believe in the great *what if*.' He said, 'Now what if, tomorrow morning, we were to wake up and find thirty spaceships, fifteen miles wide, hovering over the thirty biggest cities in the world. Wouldn't that be the most monumental day in the history of mankind — wouldn't that be the most exciting thing that ever happened?' And after he answered the question, he sat back down next to me and said, 'Hey, I think I've got the idea for our next movie!' So we took off to Mexico, we wrote the script in four weeks, we gave it to our agent on a Wednesday, the agent sent it out to the studios on Thursday, by Friday morning we had nine offers, by Friday night we had sold it to Fox, and by Monday morning we were in preproduction."

The destruction of cities and landmarks by interplanetary attackers recalls earlier films, such as *Earth vs. the Flying Saucers* and *War of the Worlds*. Devlin acknowledges this. "You know, if you're going to make a science fiction film today, you can't deny what's been in the past. You have to build on top of it, because great stuff has happened. You have to really take everything as your stepping stones. But the good news about that is that it creates a shortcut language for people. In *StarGate*, when we put a transporter in the pyramid, as a way to get into the spaceship, we never explain it. People just kind of went, 'Oh, there's a transporter.' It's become part of the lexicon. It's a real advantage.

"That's the beautiful thing about science fiction fans. Of all the genres, they're simply the smartest fans, because they read, they think, they're often involved with computers, so you never have to talk down to them. That's why I think a lot of science fiction fails — because they're talking down to an audience that is so far ahead that they don't need it. What we tried to do in *Independence Day* is to draw upon a lot of references to pre-existing UFO mythology. But we don't explain the references; we just make them and we figure if you know them, you'll enjoy it, and if you don't know them, you can just watch a lot of stuff blow up and have a lot of fun with that."

And there's plenty of blowing up to go around. Audiences around the country are watching the *Independence Day* trailer and reportedly cheering when the aliens blow up the White House. "I love that," says Devlin, "because I think the White House is the symbol of the free world, and the idea of that thing going is an incredibly guilty pleasure. On the one hand, it's a spectacular image and something that's shocking; no one can *imagine* that symbol being blown up, and on the other hand, it's a very uneasy feeling: I don't think anyone would really like the idea of our White House being blown up. Upton Sinclair, when he wrote *The Jungle*, was trying to tell a story about immigrants coming to this country, and when people read it, they got a story about tarnished meat. He said, 'I reached for their hearts, and I got their stomachs.' In a sense, I think that trailer did the same thing."

It would seem that *Independence Day*'s aliens are an unstoppable menace, but Earth's forces have an ace in the hole: One of the alien "attacker" ships crash-landed intact on Earth over forty years ago ... in a town called Roswell, New Mexico. "The standard mythology about Roswell," Devlin states, "was that in 1947, on the Fourth of July, a spaceship crashed and two aliens were killed and one survived for a while. The bodies of those aliens and the spaceship were moved to a secret base in Nevada, code-named Area 51. That's the pre-existing mythology, and what we try to do is tap into every bit of pre-existing mythology and explain it in one bigger story. So we try to bring [the Roswell crash] in, the crop circles, all the abduction stories, and make it so that all of these things make sense in a grander scheme.

"We enjoy that sort of thing, and it's also kind of a theme in our work. *StarGate* was an attempt to explain why the pyramids were built. There are great mysteries on this planet, and it's fun to speculate."

In a final wink at *The Poseidon Adventure*, which was released just before New Year's Eve, Twentieth Century Fox has scheduled *Independence Day*'s premiere for July 3. □

FUSION SUMMER

Continued from page 59

Maybe she was right. After all, the fusion cycle had delivered layers of complex molecules to the surface. Maybe the crystalline soil down there needed its fusion summer, to wipe it clean and invigorate it, regularly.

And I'd destroyed all that. Guilt stabbed at my stomach.

"Anyhow," Brind said, "it's left the Prion without a trading resource, as they hoped."

"Imagine my concern," I said.

"I think we're heading for home, Meacher. We'll be at the Lagrange point gateway in a couple of minutes. Prepare yourself."

"Thanks." A couple of minutes, and eighteen years into the future...

The hot hydrogen would start spewing into the Solar System, out of the UN gateway, a few hours before I arrived. It would take a while to exploit it. "We'll have to set up some kind of capture and processing facility," I said, thinking aloud. "It might take a couple of decades. But then the whole of the Saddle Point radius will be open with us." That was true; it was a fact of celestial mechanics that it took a lot less energy to move from one point in an orbit to another than to climb all the way out of a gravity well. Our ships could now emulate the Prion's flower-ships, swooping around the Sun, and out to new gateways.

"Brind, if this works —"

"Yes?"

"I've opened up the Galaxy for humanity." I tried to put aside my guilt and regret over the lichen. "Not bad for government work."

Pink light gathered around the scuffed hull of the old Spacelab. The gateway was close now.

I'd feel differently once I got home, I figured.

Brind said, "You know, I remember the last words of Reid Malenfant, as he fell into the first Saddle Point."

"Did you know Malenfant?"

She said, "*This changes everything.*"

EIGHTEEN YEARS LATER, WHEN I GOT BACK TO Earth, Brind was long dead. I said goodbye to her biopro Virtual as a kind of tribute.

I flew into KSC in a Sänger scramjet trainer.

I could see from the air that the center was full of activity. Refurbishment crews toiled around the gantries on ICBM Row, and a line of steel gleamed, arrow-straight and kilometers long, as the old Shuttle Landing Facility was reworked as a spaceplane runway.

My scheme worked; and in a way I fulfilled Brind's covert mission. Sometimes it overwhelms me; even now I figure most people don't understand what this really means. My God, I really have changed the fate of mankind. Maybe I've even earned myself the right to pilot my own spacecraft, in future. But I've paid a hell of a price, and I'll live with that forever.

When I climbed out of the Sänger's cockpit, Florida sunlight enveloped me, like fusion

THE PROCEDURE

Continued from page 41

the other old men flailed away at him with their branches. The rain and the din drove them, sustaining a frenzy that seemed both to embarrass and to offend Dr. Garer.

"Shouldn't we go after him?" I said.

"No." Panalat Garer gripped my wrist. "To go up there is to buy into that nonsense."

"I feel helpless watching." Which I did. One of the men had bloody gashes on his forehead and knee.

"You could pray," Dr. Garer said.

I looked at her, not knowing if she meant this as a rebuke or as permission. So I prayed silently that Girmisur Garer and his friends be spared harm from the storm's fury and their own unseemly fits.

Instead of calming down, the old men began to hoot, jumping about and swinging their fronds even more violently. Dr. Garer grimaced and hugged herself. I stood beside her, miserable in my strangerhood and futility.

The acquaintances or families of some of the other old men joined us under the screeline. The doctor nodded at them, and they at us. Then everyone waited in the rain and lightning for the revelers to abandon their frenzy and rejoin us. At length, they did, but Girmisur last of all. Dr. Garer and I climbed through the gravel to meet him and escorted him to the house. Dulatod greeted us with towels and hot fragrant drinks.

"Put him to bed," Panalat Garer told her mother.

"It doesn't happen that often anymore," Dulatod said. "Not in ages, and we've had other storms."

"I enjoyed it!" Girmisur said. "It was exhilarating! It was — !" He smiled, a faraway cast to his eyes.

I wondered if my prayer had helped bring him down without injury. Probably not. After all, the other waiting Iiolr had taken their crazy chamas or grandchamas home without benefit of prayer, and one old man had hurt himself quite badly. Girmisur went to bed — in a room behind the kitchen — and that was the last I saw of him during my stay in Iiol. Dulatod returned to Dr. Garer's study and apologized for Girmisur's antic fit and my soaking when I tried to help him.

"I didn't mind," I said truthfully.

Mother and daughter looked at each other, and Dulatod said, "Forgive him, Pani. He can't help himself."

"Why can't he?" Dr. Garer rubbed her hair with a towel. "All my tests clearly show he lacks an enthusiast node. He's never had one."

"It's chemical," Dulatod said. "Chemical, chimerical, and chimpanic." She grinned. Her grin expanded into a smile. Her smile progressed to laughter.

"If he once saw himself, he'd desist forever," Dr. Garer said, also laughing.

"Forever," said Dulatod.

"He looks like an enraged baby."

The women forgot me, making tender fun of the only male in their household. When they heard Girmisur snort in his sleep, they rolled their eyes and broke up again. Just then, I meant as much to them as a doorstop. That was fine. I relished my facelessness and the women's evident affection for an old fool.

BACK IN GANHK, I UNDERWENT THE PROCEdure. The lightscalpel found, cut out, and scorched the tumor that had given vigor if not life itself to my Corderism. The structure afterward lay in a basin, an obscene bit of charred pink.

The procedure relieved me of my enthusiasist tendencies, at least for a time. I went to work in Ganhk handcrafting lutes, dulcimets, and guitars from materials altogether new to me, instruments that sold well and cropped up in the hands of young men and women on Kivit's riverwalks.

I saw Zarafise Koh several times, but always at a distance, running errands for her chapterhouse and twisting her fingers about as if threading beads, even though she never had anything in them.

When it stormed, I liked to go up into a glass building and walk through a skybridge. The Kivit boiled, and the courtyards clattered. At such times, I imagined Chamba Girmisur cavorting like a lunatic ape in the scree above Iiol.

A checkup twelve days after the procedure indicated that a fresh structure had begun to grow under my left arm. I asked for a meeting with another physician. Dr. Garer suggested a colleague. When his test results duplicated hers, I returned to Dr. Garer. She did the procedure again at a cost that my work barely enabled me to meet. This time I stayed tumor-free for nine days.

"Take it out again," I told her.

"And the cost?"

"I'll sell my tools and equipment."

"There's no guarantee it won't come back, Drei."

"Remove it anyway."

She did, and a fresh structure appeared five days later in my groin, like a piece of gravel. At great cost, surgery again excosed it, but three days later Dr. Garer found another tumor at the base of my thumb. A colleague, Dr. Kets, offered me the surgery again, this time as an outright gift.

"No," I told him. "Enough."

Although I ache to live on Doen as a lucidist, I am clearly one of those in whom the structure repeatedly grows back. At night in bed this knowledge bewilders me, but during earthquake and storm it goads me irresistibly to my feet.

Tomorrow, I go hunting Zarafise Koh in earnest. I want to put something like hope — maybe even an evergreen branch — in her hands.

Simultaneously, to my chagrin, I want to invite Panalat Garer to a picnic on the nearby bluejoint prairie. Despite my affliction, she could say 'yes.' □

BOOKS

Continued from page 16

say about this story that hasn't been said, and better, in a dozen or more places? It won the Hugo and Nebula in 1991 and probably deserved them. The story is both complicated and compelling; it drew me in and kept me there till the end. How can you not love a story that pits the various manifestations of the Hemingway legend and the Hemingway persona across multiple universes against what passes for God them/him/itselves?

By the time the reader gets to "Images," there's at least one minor theme developing: transformation. Change on both the literal and spiritual level. Here it manifests as a just-visiting-Earth fifth dimensional being with a much better understanding of human nature than most humans seem to have. Haldeman takes the story of a scarred voyeur and an apparently prudish actress and turns it into something sweet. Romantic, even. Neat trick.

Many of the stories here draw on Haldeman's combat experience, but "The Monster" makes it central. The "monster" of the title might be some unknown creature in the Southeast Asian jungles, or it might be the narrator himself. Uncertainty is left until the very end. No transformation, though, unless you count the narrator's facility with language to change people's perception of him. OK, it's reaching a bit. It's sometimes too easy to find what you're looking for.

Like the "The Monster," "Graves" concerns possibly supernatural goings on in the Viet Nam jungles. Two members of Graves, the army group responsible for the tagging and shipment of dead bodies, are called to a forward area to examine a rather strange corpse. What follows is either a straightforward supernatural tale or an example of post traumatic stress, or maybe both. Also like "The Monster" and several other tales, it draws on Haldeman's combat experiences and avoids giving the central character's name for some pages, if at all. I don't know if this delay was a conscious decision or one that evolved organically from the writing, but I couldn't help noticing the trend.

"None So Blind," the title story, is another of the award winners in this collection. It hinges on the notion that the visual centers in the human brain are essentially idle in the blind, and, with all that excess capacity, why aren't all blind people geniuses? This is the question the budding genius Cletus Jefferson asks himself as he meets and proceeds to fall in love with a blind classmate. This is the question he keeps asking himself throughout his life as curiosity becomes obsession.

Like many of the stories in the collection, this one is idea rather than character driven, but as usual Haldeman chooses interesting characters to carry the narrative. Once the situation is set up, however, it proceeds with a sort of sketchy speed as Cletus's work pushes him to a logical course that is at once transcendent and horrifying.

As for the stories not mentioned, that has more to do with the nature of the pieces themselves than any reaction to them. For instance, "If I Had the Wings of an Angel" left me misty-eyed, but anything I said about it would be clinical, and, for a story whose effect is mainly emotional, irrelevant. "Beachhead," on the other hand, is a parable, as the author himself admits, in the company of allegories like Le Guin's "Those Who Walk Away From Omelas" or William Shunn's "Two Paths in the Forest Toulemonde." That's pretty good company, but then so are the stories in this collection.

—Richard Parks

RECENT AND RECOMMENDED

Not all of our readers want to become science fiction writers, but sometimes, considering the tens of thousands of manuscripts that have tumbled forth from the post office box in Damascus, it would be easy to think otherwise. If only it were possible, we'd track down all of those potential authors and make them read Robin Scott Wilson's recently released *Those Who Can* (St. Martin's, trade paperback, 332 pages, $13.95), as useful a text on how to write as has ever been published. Wilson's title thumbs its nose at George Bernard Shaw's famous dictum, "Those who can, do; those who can't teach," by gathering as his contributors SF luminaries who have proven themselves capable of doing both. The volume is divided into six sections on different aspects of writing, such as plot, character, and theme. Twelve different SF writers present their classic tales, and accompany them with essays illuminating how the stories came to be. Frederik Pohl uses his humbling "Day Million" to expound on style, Harlan Ellison sheds light on character with the help of "Pretty Maggie Moneyeyes," and Damon Knight uses "Masks," his tale of identity and alienation, to explore theme. Other writers include Jack Williamson, Samuel R. Delany, Joanna Russ, and Ursula K. Le Guin. This book is the equivalent of a college education for any writer, particularly those just starting out. So before you write, please read this. □

Books To Watch For

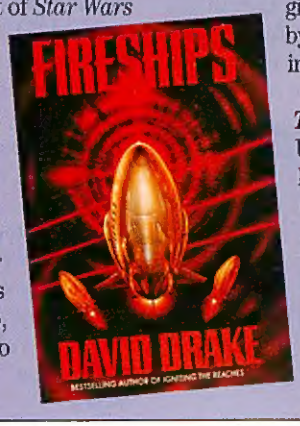
The Williamson Effect, edited by Roger Zelazny (Tor). Jack Williamson has published stirring SF in each of the past eight decades. Now seventeen top writers pay him tribute with stories of their own, including Frederik Pohl, Ben Bova, and Andre Norton.

Before ... 12:01 ... After, by Richard A. Lupoff (Fedogan & Bremer). Before there was the hit film *Groundhog Day*, there was Lupoff's strangely similar tale of life as a rerun of second chances. Now back in print is the story that did it first and best.

The Best of New Worlds, edited by David Garnett and Michael Moorcock (White Wolf). For fifty years *New Worlds* was the United Kingdom's premiere SF publication, introducing to the world classic tales by Ellison, Spinrad, Ballard, and others. Now read their best.

Honor Among Thieves, by David Weber (Baen). Weber's series about Commander Honor Harrington has proven so popular that the latest installment is a hardcover release. The spirit of *Star Wars* melds with the heart of Horatio Hornblower in this space opera adventure.

Fireships, by David Drake (Ace). From the pen of a master of military SF comes the third book in the series that began with *Igniting the Reaches*. After thwarting the president's plan to take over her ship, Captain Blythe decides to join the Venus rebellion.



The Year's Best Science Fiction, edited by David Hartwell (Harper Prism). Where once many different year's best collections were published each year, recently the field has become monolithic. Respected editor Hartwell delivers a different view on 1995.

Synthesis and Other Virtual Realities, by Mary Rosenblum (Arkham House). Winner of the Compton Crook Award, her linked "Drylands" stories have made her one of the most popular new writers of the '90s. Her first short story collection is cause for celebration.

Starborne, by Robert Silverberg (Bantam). Not content with winning five Nebula and four Hugo Awards, Silverberg continues to astonish. His latest novel is set in the twenty-third century, and concerns a starship in search of habitable worlds which finds something deadly instead.

The Best of Clifford D. Simak, edited by Clifford D. Simak (Tachyon Publications). The late Clifford Simak won both the Hugo and Nebula for his writing, and was given the Grand Master Award by SFWA for his body of work in 1976. Discover his best.

How to Mutate and Take Over the World, by R. U. Sirius and St. Jude (Ballentine). Two-thirds of the creators of *The Cyberpunk Handbook* (featured in the Alternative Media section of our January issue) have unleashed another deliciously subversive blend of SF and science fact.

CONTRIBUTORS

JACK WILLIAMSON IS ONE OF THOSE about whom the proverbial description "needs no introduction" is true. But he is deserving of one nonetheless. Since the publication of his short story "The Metal Monster" in a 1928 issue of *Amazing*, he has published compelling SF in each of the past eight decades. In 1976, he was given the second Grand Master Nebula Award from the Science Fiction Writers of America (having been preceded only by Robert Heinlein). So well-loved is Williamson and his work that a recently published volume, *The Williamanson Effect* (Tor), edited by the late Roger Zelazny, features writers such as Poul Anderson, Andre Norton, and Frederik Pohl paying tribute to his sense of wonder with original stories of their own.

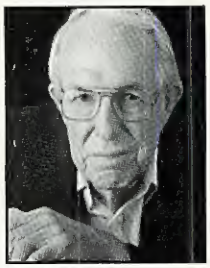
Following up on his critically acclaimed *Steampunk Trilogy*, **Paul Di Filippo**'s *Ribofunk* has just appeared from Four Walls Eight Windows, containing all of his short stories in his newly invented ribofunk genre (including "Up a Lazy River," previously seen in these pages), plus one new novella. Readers familiar with Di Filippo's screwball point of view will not be surprised to learn that he has joined the editorial board of advisers on *News of the Weird*.

Since his first short story sale to *F&SF* ten years ago, **Phillip C. Jennings** has published dozens of gonzo stories, many of which were set in the same universe and later collected as *The Bug Life Chronicles*. His first novel, *Tower to the Sky*, was also set in the same milieu. **Richard Parks** has published fiction in the Esther Friesner-edited "vampires in the arts" anthology *Blood Muse*, as well as the magazines *Abrupt Edge*, *Tomorrow SF*, *Adventures of Sword and Sorcery*, and *Dragon*. His fantasy, "The Ogre's Wife," which appeared in our September issue, was voted Best Short Story of 1995 by you, our readers. He has also been writing criticism for the review magazine *Tangent*.

Bob Eggleton was the winner of a Best Artist Hugo at Conadian, the World Science Fiction Convention held in 1994 in Winnipeg. *Alien Horizon*, the first collection of his work, has recently appeared from Paper Tiger, and a collectible trading card series spotlighting his career will soon be out from Friedlander. **Dan Perez** is editing the second issue of a special magazine for Sovereign Media, *Sci-Fi TV Fall Preview*. He has short stories in the anthologies *100 Vicious Little Vampires*, *Xanadu 3*, and *100 Wicked Little Witches*.


Robert Reed


Dan Perez


Jack Williamson


Richard Parks

MICHAEL BISHOP IS A MULTIPLE SF award winner, having been honored with Nebula Awards both for his novelette "The Quickening" in 1981 and his novel *No Enemy But Time* in 1983. Four collections of his short fiction have been published, including *Close Encounters With the Deity* and *Emphatically Not SF, Almost*. **Don D'Ammassa** has been reading and collecting SF for 35 years. He has published nearly a hundred short stories as well as the novel *Blood Beast*, and is the book reviewer for *Science Fiction Chronicle*.

Stephen Baxter has received unparalleled praise from Arthur C. Clarke, who called *The Time-Ships*, his most recently published book, "the most outstanding work of imaginative fiction since Stapledon's *Last and First Men* and the best possible contribution to *The Time Machine*'s centennial year." His other published novels include *Raft*, *Anti-Ice*, and *Flux*. He lives in Buckinghamshire, England with his wife Sandra.

Joel Naprstek has been painting for more than 24 years, and has a particular interest in SF's older styles. In the past he has taught at the School of Visual Arts, and he is currently teaching at the Joe Kubert School. He is hard at work on a graphic novel based on the Flying Tigers for Kitchen Sink. Naprstek is a native of New Jersey. **Cory Doctorow** has been published in the magazines *On Spec* and *Pulphouse*, as well as the anthology *Air Fish*. He is a graduate of the Clarion Science Fiction Writing Workshop. Lately, he has parlayed his computer expertise into a role as producer of the CD-ROM adaptation of the sadly defunct *Prisoners of Gravity* TV show.

Robert Reed was the first grand-prize winner of the Writers of the Future contest. His critically acclaimed novels include *Black Milk*, *Down the Bright Way*, *The Hormone Jungle*, and *The Remarkables*. His short story "Utility Man" was a finalist for the 1990 Hugo Award. □

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